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ORIGINAL ARTICLES

CARCINOMA OF THE COLON*

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PRESENTING a paper on Carcinoma of the Colon to other than an audience of surgeons demands explanation. Perhaps the most important reason for presenting it is that there were 90,000 deaths from cancer in the United States in 1918, and that more than 10 per cent. of these deaths were due to carcinoma of the intestines. It is true that any single medical man sees comparatively few cases in general practice, but in the large hospital clinics it often seems as though practically all surgery has to do with carcinoma. It is true also that the more attention there is paid to a given subject the more cases are found—as, for example, duodenal ulcers, which were hardly ever seen only a few years ago, now make up an important part of a hospital service.

It is important for us who have these conditions constantly before us to call the attention of those who see many cases, but comparatively few of any one condition, to the more important diseases; for it is upon the general practitioner that progress largely depends. Take, for example, acute appendicitis. Surgeons have gone from one technic to another, each time announcing the great improvement in results. It is true that the improvement in the death rate has gone on, but it is to the credit of the general practitioner who has gotten his cases to the surgeon earlier and earlier, and not to any great improvement in the operation itself. As a matter of fact, there are few surgical conditions the results of which are not dependent upon the dispatch with which the medical man gets the patient to the surgeon. It is certainly true of all acute abdominal conditions and all malignant disease. Certainly the results of nearly all conditions, both immediate and remote, depend almost entirely upon the alertness of the medical man in recognizing early suggestive symptoms, and then in sending the patient where a definite diagnosis can be made. I say suggestive symptoms deliberately, because the diagnosis is often difficult, and requires much in the way of X-ray and laboratory work before an approach can be made toward a definite diagnosis.

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If so much depends upon the physician, our duty as surgeons is to bring the subject of carcinoma of the colon to his attention at frequent intervals and to aid in the recognition of early symptoms. The symptoms of obstruction are the ones most often recognized, and obstruction occurs late in the course of the disease. The early symptoms are simply those of slight irritation of the colon—that is, the bowels may be slightly irregular, with rather more gas than usual, and if the stool is examined there may be an occasional bit of blood seen. Repeated examination of the stools may reveal an occasional positive benzidin test. These are the few and indefinite symptoms that the physician should keep in mind, for they are the early symptoms of carcinoma of the colon.

The *late* symptoms (those generally recognized as due to carcinoma but really very largely the symptoms of obstruction) are constipation or frequent stools, pain or more frequently only abdominal discomfort, and blood in the stool or on the stool,—symptoms that we all ought to recognize, yet they are frequently overlooked. I do not want to take up your time in going over the symptoms in text book style, but simply call your attention to a few facts which may be of value to you in diagnosis.

A careful history is of greatest importance. If a careful history is taken one will frequently find that there has been an increasing constipation to complete obstruction, or to frequent small stools, but this information will usually be obtained only by direct questioning, largely because everybody feels that constipation is a normal condition. As to frequent movements or diarrhea, the patient will rarely admit that he has a diarrhea, while if he is questioned about the number of times he goes to stool he will admit that he has gone from three to fifteen times a day, and frequent stools or a frequent desire to have the bowels move is one of the most frequent symptoms of a partial obstruction of the colon, and that obstruction is most often carcinoma.

Pain is a most confusing symptom because these patients seem to become immune to it. One often sees visible peristalsis with a coil of bowel in marked spasm, yet the patient does

not acknowledge pain. They do acknowledge discomfort, and that discomfort is practically always below the umbilicus. Not infrequently it is in the right lower quadrant, because of the reverse peristalsis forcing gas and intestinal contents into the caecum. It is here that we not infrequently get perforation due to obstruction anywhere below the hepatic flexure. A case recently entered the Massachusetts General Hospital with peritonitis due to perforation of the caecum which was caused by obstruction due to a carcinoma of the rectum. Many cases of carcinoma of the colon are diagnosticated as appendicitis because of this pain in the right lower quadrant. Twice within six months I have removed a large growth from the transverse colon in patients who had shortly before had their appendices removed because of a mistake in diagnosis, and the diagnosis of appendicitis has been made in several other cases during the last few years. The localization of pain in intestinal obstruction is interesting and instructive. Many years ago Dr. Maurice H. Richardson called my attention to the fact that pain due to large intestine obstruction is always below the umbilicus. Occasionally a patient will localize pain at the site of the obstruction, but this is rather rare. The pain of small intestine obstruction is at or above the umbilicus.

Blood, pus, and mucous are often given as symptoms of carcinoma of the colon, but it must be remembered that in the scirrhus type these symptoms are often not noted. When they are present they are of great value and should not be considered as due to hemorrhoids. In carcinoma of the left colon it should be remembered that a positive benzidin test is often absent, even when blood is present. In this location the stool is often formed and the blood is found only on the outside of the stool. Unless a fragment of the stool with blood on it is taken the benzidin test will be negative. I have seen these statements on the records of the Massachusetts General Hospital: "Macroscopic blood present"—"Benzidin test negative."

Blood, pus, and mucous are not pathognomonic of carcinoma, but are found in ulcerative or infectious colitis, dysentery, or any localized ulceration of the colon. It is in this group of symptoms, so often confusing, that we have an instrument, the electric lighted proctoscope, which is of great value in determining their cause. In the Northern states we have ulcerative or infectious colitis, while in the Southern states dysentery is not unknown, and in both, blood, pus, and mucous are present with frequent stools. In both the proctoscope will show a reddened and easily bleeding or ulcerated mucosa. In tuberculosis we may also find ulcerations in the rectum. A normal rectal mucosa with the above symptoms always means an ulceration above and that ulceration is practically always malignant disease or a localized tuberculous ulceration. I have never seen a colitis or dysentery with a normal rectal mucosa. As an example of the value of the proctoscope, I saw Mrs. R. because of frequent stools with blood, pus, and mucous. A proctoscopic examination revealed a normal rectal mucosa. Operation was advised and refused. A "specialist" on colitis, in another city, made the diagnosis and treated her for colitis, without a proctoscopic examination, and continued to treat her for nearly a year when she went to another "specialist" who promised to cure her colitis. Within two weeks of that time I removed a large carcinoma of the splenic flexure, just one year after the operation was first advised.

Diverticulitis is a disease which is occasionally mistaken for carcinoma of the colon, but in this condition there is frequently a history of repeated attacks of pain in the left lower abdomen, accompanied by tenderness, extending over a period of years. Diverticulitis practically never causes bleeding in spite of many statements to the contrary. If an X-ray shows a diverticulitis to be present and there is blood and pus in the stools I would always advise operation for carcinoma of the colon. Three cases have come under my care with long histories of repeated attacks of pain in the left lower quadrant, and shortly before operation small quantities of blood were seen in the stools. Operation revealed a chronic diverticulitis and carcinoma of the colon in all cases.

It has been my observation that carcinoma of the right colon causes marked anemia much more frequently than when in the left colon. This we believed to be due to the fact that we have found the adenomatous type of carcinoma, which bleeds freely, more frequently in the right, and Sir Harold Stiles, who made the same observation, believes it due to the toxines from the ulcerating growth having a much longer absorbing surface to pass over than those from carcinoma of the left colon.

Loss of weight is supposed to be a symptom of carcinoma, but in carcinoma of the intestine this symptom is rarely present except in cases of long continued partial obstruction. The loss of weight then seems to be due to the obstruction and not to the carcinoma, for after simple colostomy the patient will gain much in weight. Loss of weight then must be considered as a very late and for that reason a very unimportant symptom.

While many patients with carcinoma of the colon have been treated for disease of the stomach, this would seem hardly necessary if we remember that gastric discomfort is almost always in the upper abdomen while fullness and discomfort in the lower abdomen, with loss of appetite, are due to disease of the colon. It is true that carcinoma of the caecum when it obstructs the ileo-cecal valve causes small intestine obstruction and discomfort in the upper abdomen. We have seen many cases of carcinoma of

the left colon and rectum treated for disease of the stomach which could have been avoided by care and attention to these details.

Much is heard about the shape of the stool, but this we believe is of little or no value. The shape depends much more upon the consisteney of the stool and the tightness and shape of the sphincter than upon any growth in the colon.

The presence of a tumor is important but there is no significance in the fact that one cannot be felt. It is almost impossible to feel a tumor, early or late, if at the flexures, in the middle portion or at the lower end of the sigmoid. Rectal examination is rarely of any value, but occasionally a tumor in a long sigmoid which falls into the pelvis can be felt. The patient should be examined abdominally, lying on the back, and if there is a tumor of the sigmoid this tends to push it into the pelvis. The patient should then be examined by rectum in this same position, and occasionally one is rewarded by feeling a movable tumor in the pelvis. I have several times made a diagnosis in this way, and only recently in a colleague. Metastases when found are of value, but negative findings are of no value in diagnosis.

I am constantly hearing the statement that a certain case cannot be carcinoma because the patient is too young. To be sure, carcinoma of the intestine does occur most frequently in the fourth and fifth decades, but carcinoma of the colon has been found at the age of three years, a considerable number of cases have been reported between ten and twenty, and a still larger number between twenty and thirty. Do not therefore let the age of a patient deter you from making a diagnosis of carcinoma of the intestine.

In considering the differential diagnosis there are a number of conditions to be considered, but this should not be a burden to the general practitioner, for whenever suggestive symptoms of carcinoma of the colon are present the patient should be sent for a thorough examination, and every possible means of making a diagnosis used. Even with all the methods at our disposal, it is sometimes impossible to make a positive diagnosis.

I would like to take this opportunity to warn you against the X-ray diagnosis of carcinoma of the colon, for even in expert hands, many mistakes are made. I could enumerate a considerable number of cases in which the growth was overlooked entirely, and many in which a carcinoma was diagnosticated when none was present. Recently a colleague telephoned me in great distress asking me to operate upon his wife for carcinoma of the colon. When I saw her I found that she had no symptoms suggestive of carcinoma, and another X-ray could demonstrate none. A well known surgeon brought his best friend to me for examination one year after an X-ray had failed to demonstrate a carcinoma of the lower sigmoid. But do not blame the roentgenologist for this, let us put the blame where it belongs, that is upon ourselves for depending entirely upon the X-ray rather than upon all the facts we can obtain.

I would like to put in a plea here for the more frequent use of the barium enema in these cases, and also a protest against the use of the barium meal in cases of partial obstruction of the colon. No harm is done by the former, while a partial obstruction is often made complete by the use of the latter. X-ray examination of the intestinal tract is of great value, but this evidence alone should not be allowed to weigh too heavily in the final diagnosis. In fact no diagnosis should be made without every aid at our disposal. The diagnosis should then be made by the person responsible for the patient, that is the surgeon, who must correlate all the facts in the case and give the final opinion. Those who make the various examinations should not give opinions to the patient.

I have spent much time on the symptoms and diagnosis of carcinoma of the colon, because it seems to me that that is by far the most important part of the paper, and as you have learned, there is no one symptom and no single examination that is of any particular value. It is only by taking every symptom, and the result of every possible examination, that we will get sufficient evidence to make a diagnosis, or sufficient evidence to warrant us in advising an exploratory operation. I would like to divide the symptoms for the benefit of the general practitioner into two groups,—suggestive and diagnostic; for if a group of suggestive symptoms is present, the general practitioner could advise further study, and leave the diagnostic symptoms to be determined by the consultant.

There are a few matters in regard to operation which I should like to take up. I should like to put in a plea for these patients that they be given the advantage of the radical operation more often. Too many times a diagnosis is made when the condition of the patient is considered too bad for radical operation by the physician and nothing is done or perhaps only a colostomy is done. This may be a good preliminary step, but it should be followed more often by removal of the growth.

If one starts out with the idea that he will operate only upon the cases he feels he can cure permanently, he is doomed to disappointment and he will let many patients suffer unnecessarily. The only way in which the surgeon can get any comfort out of these cases and the only way any progress can be made is to make up one's mind to operate upon any case which one thinks he can make more comfortable by so doing. Of course one should feel pretty sure as to his operative mortality, and determine as to whether it is too high to warrant any such course. I believe that even a mortality of 25%

should not deter one from proceeding with the radical operation. My only regret at present is that I have neglected to operate upon so many cases, for I believe that about 60% of these cases will live comfortably for three or more years after a radical operation.

In judging of the ability of the patient to withstand a resection, we, and especially physicians, are, I am afraid, influenced by the results in cases which are explored and closed without doing anything, and which do badly. In these cases the partial obstruction and the growth are left to continue their effect upon the patient. In addition to this, the mental condition is one of absolute hopelessness, for the patient knows that nothing can be done for him. After a resection the patient is freed from both the growth and the obstruction, and he has mental stimulus of having had something done for him; under these conditions he at once begins to improve. At least the great majority of these patients will stand a colostomy, and the relief which this gives will usually allow the patient to improve to such an extent that a resection can be done later. Let me urge here a short-circuiting operation where possible in place of a colostomy. Even if one thinks the patient too old or too feeble for a radical operation, practically all can withstand a short-circuiting operation, for it can be done under local anesthesia quite easily, in the great majority of cases. A great effort should be made to get these cases before complete obstruction takes place. The mortality is then low and the abdomen can be closed without drainage. We have done sixteen, with one death.

If a radical operation is to be done what type of operation shall we use. For those who still feel that some particular method of suture will allow them to resect and anastomose the colon in one stage there is, we believe, little that is cheering. "Micheliez, in 1903, showed that the mortality in the one stage operation was 42.9%, while in the two stage operation it was 12.5%. In 1907 Hartmann collected 143 colectomies for malignant disease which gave a mortality of 33.5%. In 1907 Anchutz collected 139 cases of one stage colectomies with a mortality of 46%; two stage 18%. Finkelstein, quoted by Opper, gave a mortality of 29% for the one stage operation and 16% for the two stage operation. Mayo recorded 184 cases done by a two stage method with a mortality of 17%" (quoted from Fraser & Dott, *British Journal of Surgery*).

It is evident that the two stage operation in carcinoma of the colon did much to improve results,—(1) because it permitted the patient, ill from the toxemia of intestinal obstruction and from starvation, to recuperate, and (2) it prevented any intra-intestinal pressure on the suture line when the colostomy was retained after operation.

If our statistics are correct our results, except perhaps the more recent, are not good enough, even with a two stage operation, and the reasons for this we believe to be due, not to the open method of suture so often suggested recently, but to:

(1) Improper and inefficient walling off of the field of operation, including the wound.
(2) To removal or closure of the colostomy at the second operation and failure to provide a vent to prevent intracolonic pressure on the suture line.
(3) To infection due to the presence of the colostomy in the field of the second operation.
(4) To end to end anastomosis.
(5) To the open method of suture rather than the closed.

That is, the failures are due to infection during operation or more often infection due to leaking of the line of sutures after operation. We believe that much of this infection may be eliminated by: Proper attention to walling off the operative field; by using a lateral anastomosis when there is sufficient bowel; by using the closed method of suture when possible; and by using a caecostomy instead of a colostomy. It is self evident, we believe, that a lateral anastomosis is safer than an end to end suture. To be sure, the end to end suture is anatomically and physiologically the better operation, but when we come to practical results there is little difference and the lateral anastomosis will leak less often than the end to end. The great advantage of an end to end anastomosis is the fact that it requires much less bowel and permits one to remove a longer section. The closed method of anastomosis is undoubtedly of value but it should be distinctly understood that this method is not sufficient to give good results without a caecostomy or a colostomy.

The caecostomy is probably the greatest factor in improving results. It can be done as a preliminary operation with local anesthesia, no exploration of the abdomen is necessary in the sick patients to determine the location of the disease, and it is well to the right side, away from the field of operation. It gives sufficient vent to prevent any intra-intestinal pressure on the line of sutures after resection and if a large tube is used and the bowel infolded by the Gibson method a secondary operation to close it is rarely necessary.

The blood supply to the large intestine is of the greatest importance. In the end to end anastamosis interference with the supply at the mesenteric border is undoubtedly responsible for leaking at the suture line in many cases. In suturing, great care must be used not to constrict the vessels at the mesenteric border, and in sectioning the bowel an oblique incision should be made from the mesenteric border on the proximal and distal legs to make sure of a proper blood supply on the free border of the bowel. When we come to the larger vessels there is little

danger. The middle and left colic may be tied and sectioned provided the arches close to the bowel are uninjured. Care should be taken, however, not to tie the inferior mesenteric when the bowel is sectioned above the brim of the pelvis. It is probable that the middle haemorrhoidals will not be sufficient to supply the distal end, unless the bowel is sectioned close to the recto-sigmoid junction.

Fraser and Dott say "The element which gives the operation its serious character and its associated high mortality is essentially one of infection and the abolition of this factor may revolutionize the operation results." They then present a new method of aseptic anastomosis. We believe all that Fraser and Dott say but we do not agree as to the cause of the infection. They intimate that the cause of infection is the open method of suture while we believe that the infection which does the harm, provided that proper technic has been used during the resection, is due to leaking of the line of sutures and that this is due to intracolonic pressure on the line of sutures. While we have no objection to the closed method of suture we feel that the method of suture is of secondary importance and that the fundamental principle which must be kept in mind to improve our results is the avoidance of intracolonic pressure. If this is accomplished the metnod of closure, the type of suture, and the kind of suture material used have little to do with the result. As to the suture material, we believe that a continuous non-absorbable suture should never be used, but further than that we have no suggestions.

How are we to make sure that we will have no pressure on our line of sutures? Undoubtedly the surest way is to do a colostomy a short distance above the suture line. This will give the best opportunity to empty the bowel and will prevent any pressure on the line of sutures, but there are serious disadvantages to this method:

(1) The colostomy usually requires an operation to close it.
(2) The resection must be done in close proximity to an open bowel which makes it impossible to get a sterile field for the operation.
(3) The adhesions about the colostomy which are present at times, and its close proximity, make the resection difficult.

To avoid these difficulties we believe that a caecostomy with a large half inch tube, by the Gibson method, as a preliminary operation in cases of obstruction and at the same time as the resection in cases without obstruction, most nearly fulfills all the requisites. Caecostomy has proved to be efficient in all cases in which we have used it in the last two years, but is rather disappointing in cases of complete obstruction of the sigmoid which remains complete, in that it has been impossible to empty the colon except in cases in which the contents have already been liquified. While this appears to be an objection it has been of no great importance as formed or soft feces seem to have very little effect upon the outcome of the operation. To our minds there is nothing which is so detrimental to good results as the pressure of liquid feces on the line of sutures. The virulence of the bacterial flora, the more rapid absorption of toxines from the liquid, or perhaps the fact that the liquid feces are more easily spread about, may be responsible for the bad results. We have found that it is not safe to wait for more than a week after the caecostomy if the obstruction does not let up enough to let fecal matter and gas through.

The advantage of a caecostomy over a colostomy are:

(1) The field of operation can be properly cleansed and kept clean.
(2) It is efficient in relieving obstruction.
(3) It is efficient in preventing pressure on the line of sutures.
(4) It can be done on very sick patients with obstruction, under local anesthesia, as the location of the growth need not be determined.

As a most important aid in resections of the colon, I cannot urge too strongly the use of morphine or deodorized tincture of opium for the first week to prevent active peristalsis. I know that many consider it almost fatal in cases in which they wish to prevent distension, to use morphine, but as so often happens among surgeons, what one considers a life saving measure others consider sure death to the patient.

Results in cases of carcinoma of the colon, even in advanced cases, are frequently astounding and the reason is found in the 112 autopsies on cases dying of carcinoma of the colon without operation, reported by Hausmann (quoted by C. H. Mayo) in which:

21 showed the disease generalized
36 in which the neighboring glands were involved
35 in which the disease was limited to the gut (the deep glands not mentioned)
20 in which it was limited absolutely to the gut

My plea is—do something for these cases; if a radical operation is impossible, do a short circuiting operation, if possible before obstruction becomes marked; or if that is not possible do a colostomy if there is obstruction sufficient to cause pain or frequent movements. It is all very well to say it is better to do nothing and to let them die, but the great trouble is that they live on in great discomfort for many months and even years,—they do not die as you and the family expect and hope they will.

CARCINOMA OF COLON

	No. of Cases	Deaths	Mortality %
Resections	33	6	18%
Short circuiting	16	1	6%
Exploratory laparotomy	5	2	40%

Colostomy	12	0	0
Totals	66	9	13%

Resections

		Deaths	Mortality
Left colon	27	5	18%
Right resections	6	1	16%

END RESULTS—RESECTION OF COLON

Total number of Operations	33	
Total number of Deaths	6	
		% of Total No. of Cases
Living	21	63%
Living 3 years or more	14	42%
Living under 3 years	10	
Living 5 years or more	5	21%
Living under 5 years	16	
Operated upon 3 years or more	14	
Operative mortality	6	
Died within 3 years	3	
Total living and dead at end of 3 years	23	
Percentage living 3 years		61%
Operated upon 5 years or more	7	
Operative mortality	6	
Died within 5 years	4	
Total living and dead at end of 5 years	17	
Percentage living 5 years		41%

OBSERVATIONS ON GLAUCOMA*

BY GEORGE A. MOORE, M. D., F. A. C. S., PALMER

ONE doing special work being invited to address an audience composed mainly of general practitioners, is faced by a question. Shall he speak of things pertaining to his specialty, presumably of very limited interest to the majority of his listeners, or shall he select a subject outside his immediate field likely to be of more general interest? Heretofore, my practice has been to choose the subject of general interest but tonight I will speak of a disease of the eye. I was prompted to do this, for me, unusual thing, by a question which appeared on a questionnaire recently received, sent by a Worcester colleague, about that most fatal-to-vision eye disorder, glaucoma. The question was "Do you find that the average general practitioner recognizes simple glaucoma?"

If the answer to the question is "No" whose fault is it? Very likely a portion of the blame lies with us who, when called to speak before a general body, allow an excessive fear of boring our audience, to influence our choice of subject. It seems to me, that all who have had large experience with glaucoma are definitely obligated, so far as possible, to bring glaucoma to the attention of the general man and make the answer to that question "yes" instead of no; and so tonight I am going to speak of glaucoma, or rather of some phases of glaucoma and of them in a very incomplete way. The feature I wish to emphasize is the relation of the crystalline lens to glaucoma. Naturally, much else must be spoken of but this relation is the central objective.

A discussion for informative purposes should, I believe, be limited to a statement of the present, generally accepted views but these may properly be appendixed by personal views if good reason for these views exists. In this connection it has been said that there is a proper scope to embrace before specialists but that a less latitudinous discussion is well before non-specialists. I believe the new thoughts in any line are acceptable and if a simple, clear, orderly exposition of the ordinary facts of glaucoma is desired it will be found in the text-book of that celebrated Englishman, Col. R. H. Elliot. I think an occasion of this sort calls for the less formal presentation of views gained from reading and experience. So far as I know there never has been a presentation of some of the work here recorded.

Obviously, length considerations require this presentation to be but partial and very sketchy. Perhaps such treatment of a few phases of an immense subject may entrap your interest in the whole subject. If it does it will be found that there is no insuperable difficulty in recognizing glaucoma. Every physician should be able to diagnose this trouble or make invariable practice of sending eye cases to an ophthalmologist. Glaucoma is a grievous affliction which requires early treatment at skilled hands and too often now the verdict is "too late." The work that has been done in glaucoma is so very extensive that I shall not at this time make an historical approach to the subject. The subject is a vast one and that so much about glaucoma remains in doubt is not because of lack of effort on the part of students. The work of some of these is of priceless value and without slight to other observers who have made important contributions, vonGraefe, deWecker, Leber, Knies, Weber, Priestly Smith, Lagrange and Elliot may be named as men whose work has been of prime importance.

Glaucoma is an eye disorder in which arise certain changes, due to too high intraocular pressure, which lead always toward blindness.

This definition in common with all definitions contains controversial features but it will do for our purposes. The words "too high intraocular pressure" are used to cover cases reported in

*Read at a meeting of the Wachusett Medical Improvement Society at Holden, Mass., May 7, 1924.

which the tension was within ordinary normal limits but in which the tension, whatever the tonometric readings, was too high for those particular eyes. *An average normal tension may be too high for an eye with deficient resisting power.* It truthfully has been said, first by DeGraefe, I think, that the cause of all symptoms in glaucoma is more intraocular pressure than the eye can stand. The tonometric reading, in a case with marked damage to sight, may be lower than in a case in which sight is little impaired.

That there are tidal variations of pressure in all eyes, normal and pathological, is likely and Elliot[1] explains at some length his reasons for believing there is a pressure variation in different parts of the same eye. He says pressure is highest in the vitreous chamber, lowest in the anterior chamber and intermediate in the chamber lying between the two. The cause of increased intraocular pressure is some derangement of the regulatory function which governs the balance between the intake of fluids in the eyechambers and their outgo.

The cause of such imbalance can more easily be ascertained in those cases which are due to some pre-existing ocular trouble, and which are therefore cases of secondary glaucoma. As such cases are likely because of the previous trouble to be in the hands of an ophthalmologist we may exclude secondary glaucoma from our consideration tonight and speak only of (what is called generally) primary glaucoma. There are certain variations in normal eyes which predispose to glaucoma such as a small eye; a small cornea; an actually or relatively large lens. Of the last we will speak later.

Is imbalance of intake and outgo due to excessive production of fluid or lessened capacity of excreting channels or to a change in character of fluid which make excretion through normal channels more difficult? This last possibility (changed fluid) may be excluded with secondary glaucoma as its role in primary glaucoma is not yet satisfactorily defined.

Much work has been done on the relation of blood pressure to intraocular pressure. I think the general relation must be admitted, indeed I think strong evidence of it will be found in the following matter but I do not find myself sympathetic to the belief that glaucoma is caused by either a high general or ocular-vessel blood pressure. Glaucoma often is encountered in persons of low blood pressure. In the case of epileptics who are subjected to frequent and terrific transient increase of blood pressure, I am about completing an investigation of relation of blood and intraocular pressures. With the arrangement of matter not completed it is, however, now apparent that the average pressures both blood and intraocular are high.

In 160 cases	Average age	41
Systolic Blood pressure	Avge.	140
Ocular tension	Avge	33

Remembering the age factor in glaucoma and of the above 160 cases taking only those of 45 years of age and over, these ages including only a few over 70 years of age, the figures are

Number of cases	60
Average age	56
Average systolic pressure	133
Average Ocular tension	25.4

For comparison

Average age of all (160 cases)	41
Average systolic pressure	140
Average Ocular tension	33

These figures represent the work of Dr. N. W. Giles of the Monson State Hospital for Epileptics to whom I owe thanks for a very considerable labor requiring skill and patience. The times of taking were at any time in relation to a seizure (convulsion or petit mal). Some measurements were made during convulsion. The measurements made a short time after or before a seizure showed no great variation except in blood pressure. The blood pressure after a series of grand mal attacks (8 to 12 hours after) was low. The blood and intraocular pressures in the few cases secured during attack were high; there is some doubt of the validity of the eye tensions secured at these times as the difficulties to be surmounted in the taking were not inconsiderable. In one case during attack the Schiötz reading=47.

The extraordinary fact will be noted that in the 160 cases with average age of only 41, the averages of blood and eye pressures were higher than in the series including only those of 45 years and over. A full report will be available soon. Whatever one may deduce from these figures an interesting fact in connection with epilepties is that during an experience of many years' observation of patients at the above named hospital with its hundreds of patients, I never have seen a single case of primary glaucoma in an epileptic. The superintendent of the hospital, Dr. M. B. Hodskins, when asked said he never had seen a case either in or out of the hospital in an epileptic. This proves nothing of course but is not without interest.

An eye surgeon must be impressed by the speed with which the anterior chamber is reestablished after section has allowed escape of the aqueous; in some cases it requires but a very short time. Elliot[2] estimates the time necessary for the escape through normal ways of the amount of aqueous contained by the anterior chamber at about 48 minutes. The feeling, that a secretion derived so rapidly from highly vascular structure may be influenced by the blood pressure in the amount and speed of secretion, is a normal one and within limits such influence doubtless is exerted. Our thought may be influenced by what occurs in the kidney as a result of pressure change but the two processes are not analagous. A nearer parallel, in my opinion, is found in the ventricular spaces of the brain.

The intraocular fluid is regarded by some (notably Priestly Smith) as a secretion, by others as a transudate. Persons regarding it as a secretion view it from the standpoint of its manner of production, the others from the standpoint of its uses. Aside from its local nutritional effects the intraocular fluid, so far as I know, contributes nothing essential to the organism. Neither does the cerebrospinal fluid do more and it too is the result of cell activity. Indeed the production of the eye fluid by the cells of the ciliary body with its rich blood supply seems very like the process by which the ependymal cells in the ventricles of the brain, in close proximity to the choroidal plexus, produce the cerebro-spinal fluid. The method of escape of the cerebrospinal fluid along fibrous prolongations to the sinuses and along the spaces around vessels and nerve trunks seems very like the method of escape of the aqueous, along the prolongations of Descement's membrane which form the pectinate ligament at the canal of Schlemm and around vessels and nerve trunks. Is one of these fluids a secretion and the other a transudate or are they reasonably similar enough to be included in the same general class? In certain inflammatory disorders the cerebrospinal fluid becomes altered and its escape through the regular viae is hindered. This is just as true of the eye. The power of the fluid-producing mechanism of the ventricles to accumulate fluid in the spaces against great pressure has a classical example in internal hydrocephalus; but in this disorder the cause lies in stoppage of the way of escape usually and not in altered fluid. This also is true of the eye pressures in glaucoma, the final devastating pressure being due to blockage of escape avenues. The great pressure in internal hydrocephalus is evidence by the dilatation of the spaces at the expense of the brain substance and the thinning of the bone of the skull to wafer thickness in certain cases. The power of adaptation of the brain, however, enables it to stand this pressure better than seems possible, providing the advance is gradual and in some cases to retain to a remarkable degree, under the circumstances, the mental faculties. A more rapid onset would result in death in a short time. The eye too exhibits in glaucoma, remarkable adaptative powers if the pressure advance is not what Elliot calls "steep." The adaptative power of the eye includes, I believe, an acquired ability of the subcapsular epithelium to live and function under the great pressure of many cases of glaucoma. In the excessive pressure of certain cases of glaucoma, or where the pressure rise is too "steep" for the adaptative power of the eye, observable changes occur in the epithelium beneath the anterior capsule. The writer believes that the green reflex in certain cases is due to change in this epithelium. In certain cases in which he has removed the lens in glaucoma the green reflex has disappeared. When a lens has been subjected to a great pressure, gradually applied; and which has developed the adaptative power of the epithelium to live under such pressure, it is conceivable that sudden reversal of the pressure condition (a "steep" decline) may tax by its speed the (re-)adaptative power of the lens cells. A normal or subnormal tension following iridectomy or other operation for relief of glaucoma may cause change in the lens epithelium ranging from temporary modification of function to complete, permanent loss of cell function, especially in those cases in which the integrity of certain portions of the lens has already been interfered with, as in incipient cataract. Wheeler[3] (Cataract after Glaucoma. Its Etiology and Treatment. Amer. Acad. Opthal. and Otolar. 1923) said "——— persistent hypotony, resulting from operation for glaucoma, may have cataract as one of its degenerative manifestations."

In addition, it is possible as I pointed out in a discussion of the above named paper at Washington in 1923, photochemical activity exerted upon an already altered lens as in incipient cataract may be a factor.

Merely as a matter of collateral interest I will pass around photographs of brains which show the dilatation of ventricles mentioned. Note the enlarged spaces and thinned cortex. That the eye is a part of the brain set forward on the "optic stalk" is known to all; this is emphasized to one's mind on looking at a section of an embryo showing the cerebral cavity and optic vesicle. Raymon y Cajal[4] says "——— axones terminating in the superficial layers of the superior colliculus originate in the ganglion cell layer of the retina." Barker[5] quoting this says "The lateral geniculate body and the superior colliculus of the corpora quadrigemina have been designated as 'primary optic centers' in the brain. Inasmuch as the peripheral optic neurones correspond to the bipolar cells of the retina and the ganglion cells of the retina really represent a part of the brain, it would seem more logical to call the ganglion cells of the retina the primary optic centers and the geniculate body and the corpora quadrigemina the secondary optic centers of the brain. The ganglion cell layer of the retina corresponds to the nucleus funiculi gracilis and the nucleus funiculi cuneati of the general sensory path." It is obvious that from a cisternal organ into which fluid is constantly entering, a related escape of this fluid must be maintained if pressure is to be kept at a balanced point. We may picture the eyeball as a partly partitioned space, with communication, however, between the chambers formed by these incomplete partitions. From before backward the chambers are, the anterior chamber, occupied by aqueous humor, the posterior chamber also occupied by aqueous and the vitreous chamber occupied by the vitreous humor. The communication between the anterior chamber and the posterior chamber is by

the pupil, the communication between the posterior chamber and the vitreous is through the narrow space around the edge of the lens, the circumlental space. This space is bounded on one side by the edge of the lens and on the other by the ciliary body with the suspensory ligament connecting the two. This has been called by Elliot because of its narrow space connecting two lakes of fluid "the straits." The intraocular fluid enters at the ciliary body and it is believed that there may be a division of the supply, one amount of the supply finding its way directly forward at the posterior chamber the other being behind the partition composed of the lens suspensory ligament and ciliary body must therefore go directly to the vitreous unless it finds a way through "the straits" at the circumlental space. If the normal pressure of the eye, through a governed balance of the intake and outgo of fluid, is to be maintained, there must be a flow from the vitreous chamber through the straits to the posterior chamber and from the posterior chamber through the pupilary space to the anterior chamber in the angle of which is situated the *main avenue of escape, the pectinate or cribiform ligament.* Through this ligament which is composed of fibres from Descemet's membrane the fluid finds its way into the canal of Schlemm. Leber, Knies, Weber and others established this last stated fact and its tremendous importance can scarcely be overrated. It has become a matter of such general belief, that if the angle can be kept open egress of fluids through these channels will prevent glaucomatous disaster, that too little attention has been paid to the importance of maintenance of permeability of the straits, which Priestly Smith and others have so brilliantly worked out and written about. *Many if not most cases of glaucoma begin with a distension of the vitreous chamber* whatever be the cause of impeded forward flow through the straits. This distension of the vitreous causes the lens, the suspensory ligament and the ciliary body to be pushed forward. With these parts pushed forward and encroaching on the posterior and anterior chambers, it will at once be seen, that the main avenue of escape of fluid situated in the angle of the anterior chamber, is likely to be interfered with, and when that occurs we have a grave condition to contend with. It, therefore, would seem well to give attention to the earlier happening at the straits. I do not know who first called the partition formed by the ciliary body, the suspensory ligament, the lens and the iris, the diaphragm of the eye, but it is a good name for it. If the work and writings of Priestly Smith, Treacher Collins, Col. Elliot and others convince us of the importance of this diaphragm in glaucoma, a brief discussion of some of the structures forming the diaphragm is pertinent. Under pressure exerted from the vitreous side the whole diaphragm may move forward. *This is the first great disaster in most cases of glaucoma.*

That there is a greater diameter for the housing of these structures forming the diaphragm, in the normal locus of the diaphragm, than when they are pushed forward into the ever lessening diameter of the forward part of the eye, seems evident. It follows therefore, that an already insufficient circumlental space is further trespassed upon, when the strucures composing the diaphragm are compressed by this movement, into closer relations and an already bad matter is made worse. With this additional encroachment, due to the increased difficulty of fluid passing through the further narrowed straits, a rapid increase of pressure in the vitreous ensues and the patient is likely to suffer *the second great disaster, the closure of the angle.*

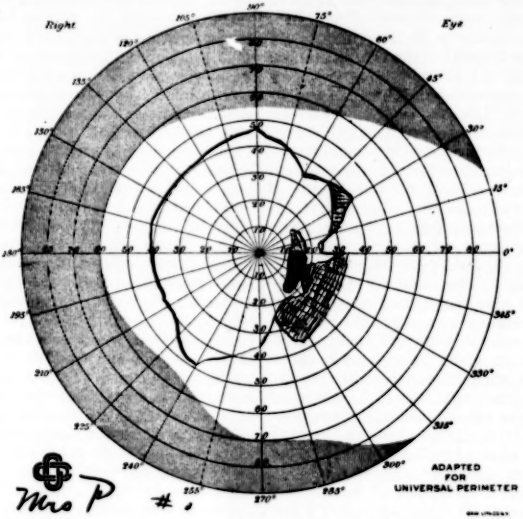
The ciliary body is a part of the diaphragm and in addition to its share in the mechanics of this phase, we may mention the possibility of irritation, stimulating it to production of an increased amount and altered quality of fluid. There is a voluminous literature on the ciliary body which will repay one interested for the effort of perusal. The nutritional supply of the ciliary is obvious but the lens and suspensory ligament have offered something of a problem in this respect. In foetal life a frankly vascular structure supports the nutrition of the lens, having its supply in the hyaloid artery, which continues from the arteria centrailis through a small canal in the vitreous (Cloquets or Stilling's canal) and terminates in a cup like arrangement of vascular structures which surrounds the lens. This cup like structure resembles in appearance the final arrangement of the whole eye on the nerve stalk. Fuchs[6] says the lens derives its nourishment from the fluids of the eye, the vitreous and aqueous, after the disappearance of the vascular structures mentioned above, which disappearance occurs about two months before birth. This structure is of mesodermal origin as is the process which forms the zonula ciliaries or suspensory ligament. It may therefore well be that in the nutritional processes of adult life the lens fares a little different from the suspensory ligament. However this may be we know that the lens suffers from nutritional changes and that the suspensory ligament also undergoes change. We, therefore, are considering two structures, the lens and suspensory ligament, both of which are known to undergo change. The character of changes in lens is such that in their course an organ composed very largely of water changes its bulk by imbibition of more fluid causing an increase in size which later is lost by a corresponding dehydration. In other words the course of lens change is in progressive cataract marked by what Fuchs[7] divides into *a* incipient cataract (a term which Professor Hiram Woods[8] in address before a general medical gathering in 1921 said "in my opinion should be left out of our nomenclature)

b intumescent cataract. *c* mature cataract and *d* hypermature cataract.

Whether the term incipient cataract should be left out of nomenclature or not I feel that the condition for which it stands should receive more scrutinizing attention than I believe it now receives. In this stage or class—incipient cataract—may be included the not infrequent "ringlike opacities" found near the equator of the lens, called by Ammon "the arcus senilis lentis." Duane[9] in his editorial additions to Fuchs' work remarks that the vision is not impaired in these cases as the opacity lies entirely behind the iris and adds that there is little tendency of the opacity to spread. There are other types in which the opacity is more or less concealed by the iris and this concealment is probably the reason why many cases of incipient cataract remain for considerable periods of time undiscovered. Especially is this likely to be true in cases of increased tension when a myotic is being used and in which a mydriatic (except for diagnosis and followed by a myotic) is contra-indicated.

The next stage or class is intumescense in which as the lens becomes more and more opaque it is the container of more and more water and with this the bulk of the lens is of course greater. Recognition of cataract if the process is not a local one can scarcely be avoided in this stage. This is a generally recognized occasional cause of glaucoma.

The next stage or class includes mature cataract in which the lens is ordinarily less in size than in the intumescent phase due to loss of water as the process advances. Mature cataract is also occasionally the cause of glaucoma and so is cataract in the hypermature stage. It also is known that through continued growth a non-cataractous lens may become large enough to obliterate a portion of the circumlental space. The stages of cataract mentioned may be duplicated in any small opaque patch found at any part of the lens and that without involving the whole lens. This renders important, areas lying out of view behind the iris which may during the phase of swelling be a factor in the closure of the "straits" without a revealing sign of the process



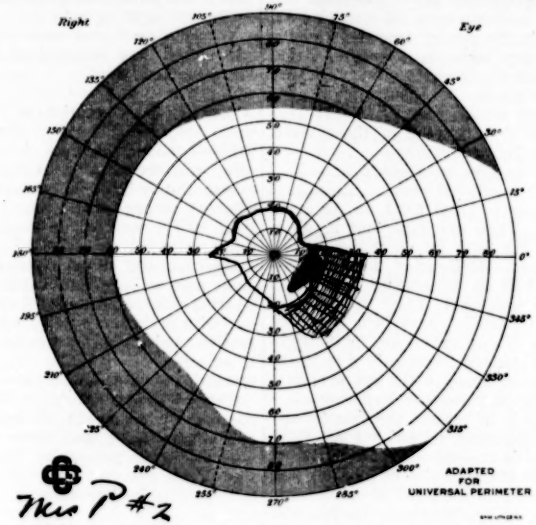
in the easily visible portions of the lens. It will be remembered that the lens is an organ that performs no work and therefore its metabolism is quantitatively neglible. So little is needed for its maintenance that the katabolic residue is very small in amount and the anabolic process not only compensates for loss but suffices for actual growth which continues so long as the capsule and the epithelial cells remain unimpaired. A constant sclerosing process goes on which begins in the oldest fibres lying in the center and forms the nucleus of the lens. The nucleus, firmer, less watery than the rest of the lens, tends to enlarge as age advances. In the surrounding softer parts of the lens spots or patches may be discovered with changed refractility that is the precursor of cataractous change. Many of these spots become opaque and whether large or small there may occur in them, a local change in density, water accumulation (or resorbtion of degeneration product) and disposal which duplicates in a small locus that which occurs in the

whole lens when complete cataract evolves. This emphasizes the importance of location of the areas of opacity in incipient cataract, it being at once apparent that such process near the equator may encroach upon the circumlental space and that any but a careful search will leave it undiscovered in its hiding place behind the iris. Errors of diagnosis which call glaucoma, cataract, have occurred and the counter possibility of failing to recognize the factor of cataract in glaucoma is worth consideration. One may say with propriety, that if a swollen lens is the cause of a glaucoma, it then falls under the head of *secondary* glaucoma. However, I think in discussing this as a primary glaucoma I am leaving it in the categorical place it occupies many times through failure to recognize the primary factor. I believe these cases exist in considerable numbers and that they are very frequently unrecognized. This is due I think to the very general knowledge that cataract *does* cause glaucoma and to the thought that the word cataract as used means the frank easily diagnosed cataracts that obtrude themselves upon the notice of patient and physician and that the word glaucoma means a frank, congestive, unmistakable glaucoma.

Elliot[10] says "the appearance of the lens in these cases (intumescent cataract) is characteristic of primary cataract, the history is *unmistakable* (italics mine) and the occurrence of a primary and hitherto uncomplicated cataract in the opposite eye often clinches the diagnosis."

He speaks of the relative infrequency of mention of intumescent cataract as a cause of glaucoma in Europe and its frequency in India. He says "The records of the Madras out-patient department show the occurrence of this complication in nearly fifty cases yearly; what is more the author has seen it come on in a number of cases which were actually under his care at the time. . . . The patients are usually those who have contracted cataract at a very early age . . . " He quotes Tacke's experience which included the finding of only five cases of glaucoma due to cataract in forty-five years' experience. Of these four were myopes.

It is seen that cataract *is* recognized as a cause of glaucoma but not with any frequency except where (as in India) cataract is almost the rule and glaucoma is (therefore?) of abnormally frequent occurrence. Vogt[11] places the number of lens opacities found at twenty per cent and Blaauw[12] confirmed Vogt's finding. T. Barth[13] says that opacities of the lens are found in 96 per cent of all persons over sixty years. My findings have been about six per cent of all persons, all ages and while this is small in comparison it is a considerable percentage. Doubtless the improved method of lens examination by the slit lamp explains the difference as I have not had the advantage of this wonderful modern help. A close examination of the lens in epileptics is soon to be made to determine the frequency of occurrence of incipient cataract in these patients. Senile cataract fortunately is very rarely found in epileptics, there having occurred during my experience only three cases of cataract, all monocular. This involvement of but one eye leaves us unsure that some trauma in patients especially liable to traumata may not have been the cause of the cataract. The in-



frequency of both cataract and glaucoma in these patients certainly does nothing to invalidate the idea of close relationship between the lens and glaucoma. Treacher Collins[14] speaking of degeneration of the lens, mentioning senile cataract, says "the first change observed is the formation of clefts between the fibres in its peripheral parts. In these clefts the interfibrillar fluid accumulates and in hardened sections of the lens presents the appearance of irregularly shaped coagulated masses, or of spheroidal bodies, the so-called Morgagnian globules. Verhoeff[15] discussing Collins' paper mentions that in cataract due to disturbance of nutrition the opacities begin in the posterior cortex while in senile cataract they begin as peripheral striae. V. Morax[16]—Cataract operations on glaucomatous patients—inquires

May we and must we operate?
At what time of the evolution of the cataract is it most suitable to operate?
In what manner shall we intervene.....?
What will be the functional result.....?

Briefly he wishes to know what we are going to do and why? These are important inquiries as removal of the lens in glaucoma carries a peculiar hazard. McKenzie[17] mentions removal of the lens as a measure which improves vision in glaucoma; Fox[18] speaking of this opinion of McKenzie's says "the beneficial results following this operation are in the light of our present knowledge, evidently due to the fact that the wound made in the eye acts as a filtration channel and relieves hypertension." My own practice is to remove the lens in any suitable case of glaucoma in which I am satisfied that the lens is the cause of the glaucoma, first operating for the reduction of tension. This practice has resulted in the removal of lenses in nearly all stages of opacification. In one case for special reasons I removed a clear lens and it must be said that this case does not support any contention that cataractous involvement is necessarily the causal factor in glaucoma as the result in this case is so far not different from that achieved in cases with opacity. The most serious happening in any case so far was a considerable loss of vitreous (in one case). The operations for the reduction of hypertension are iridotomy as described by Curran[19], iridectomy and posterior sclerotomy. I have found iridotomy of great value in other types and use it in selected cases. In this type of case I find posterior sclerotomy of value as it furnishes an immediate help at the part of the eye where the reduction is desired. The preliminary procedures and the time intervening between them and lens removal are matters of individual judgment.

I have found lens removal in glaucomatous patients rather more difficult on the whole than ordinary cataract extraction. My first cases were in blind eyes. The results were so satisfactory that the practice was extended in cases considered suitable, in which some vision still remained and the results were good. Let us recall a few points—Cataract is not proposed as a general cause of glaucoma; there are many other causes.

I think it is a more frequent cause than is generally recognized. Cataract is of more frequent occurrence than is generally recognized. It is possible that non-cataractous lenses may cause glaucoma. Measures other than lens removal are indicated in a great number of cases.

A good result ensuing after removal of the lens is not proof that a less hazardous operation might not serve as well.

Of the cases I have operated upon a few furnish interesting comparison between one eye and its fellow.

Feb. 23, 1923

Mrs. I. 49—Operation at New London 1918 upon *left* eye iridectomy. Operation had been skillfully done but eye is still red, and is blind and degenerated. Comes now with *right* eye absolutely blind, no perception. Pupil semi-dilated; cornea cloudy and insensitive; severe pain in eye and whole head. Iridotomy and sclerotomy reduced tension; symptoms abated. Congestion and severe pain recurring at intervals; pain so intractable and severe that enucleation was considered. Lens clear in center but with coronary opacity was removed in operation which looked toward removal of eye if exigency of operation required or later removal if pain was unabated.

Tension before operation 65 McLean. Lens successfully removed; all symptoms subsided, eye became quiet and three weeks later light perception was present on temporal side of retina. This eye remains quiet and placid. The *left* eye remained reactionary and tender and is still so.

Mrs P. Had nice iridectomy performed in Springfield, Mass., in Feb. 1923, but eye went to final glaucoma. No semblance of light perception. Occasional congestive attacks. Tension this date *April* 1923 70 McLean. Patient comes about *right* eye.

Tension *right* 60 McLean. Field as shown. Seidel's sign; Bjerrum's sign. Vision 20/20. Nerve cupped 4 D Incipient cataract located peripherally. Operation advised for reduction of tension. Patient undecided.

Patient comes for operation having had slight attack with visual disturbance *April* 10 iridotomy, on *right* eye; responded nicely. Further operation refused.

Mrs. P. *Right Eye Con.*

April 13 Tension 30.

April 21 Eye quiet; vision normal; further operative work refused.

May 8 Tension 30. Eye quiet.

August 29 Tension 40. Eye feels good, looks well and patient will not consider further operation.

September 28 Patient has had two attacks in

last two days; no congestion but vision greatly disturbed. Vision 20/100; Tension 45; field as shown, greatly reduced. Patient is in state of great trepidation; fears operation will produce no better result than was achieved in opposite eye. Desires positive assurance; that failing, she decides to keep the little vision she has while it lasts.

October 5 Patient has had very bad time since last date; blind at times, little vision at best times. Realizes has waited too long but implores operation now realizing the futility of medical treatment, and that she will very soon lose all vision. After a very frank discussion of her case and the hazards, entered hospital.

October 7 Removal of lens with iridectomy. Loss of fair amount of vitreous. Uneventful healing. Patient never has had the slightest discomfort in this eye since the day of operation. The eye is quiet; it has withstood three needlings without reaction worthy of the name; the tension is 28. The vision is unfortunately low but with + 11.00 + 3.00 Ax 160 she counts fingers at 10 feet. That this feature may improve is shown by the next case. The other (blind) eye, the *left*, continues to have periodical congestive attacks.

Mrs. C. Sept. 8, 1920.

Comes with history of iritis at times and today thinks is having another attack of iritis.

Left eye. No iritis; no signs left of previous iritis.

Incipient cataract. Is suffering an attack of glaucoma; congestive. After study of case advised removal of lens of left eye.

Right eye was normal except incipient cataract.

September 23, 1920

Lens removed from left eye with iridectomy; intracapsular operation.

Healing uneventful. All pain and other symptoms gone. Vision however was poor being with + 10.00 + 3.00 Ax 180 Only 5/200.

Patient was instructed to keep sharp watch over other eye and to return immediately if any symptoms appeared.

During the winter of 1922 while travel was difficult, suffered an attack of glaucoma in *right* eye and because of travel conditions had operation performed in New Bedford. Lagrange was done. Good operation but the eye did poorly and all vision was lost and the eye passed through the long inflammation which results often, as did her's, in atrophy of the iris and phtisis bulbi. After the right had become blind the correction + 10.00 + 3.00 Axis 180 which it will be remembered gave but 5/200 vision in November 1920, was placed before the left eye and vision of 20/30 was found present. In April 1924, the vision was 20/30 with the same correction. No claims are advanced in connection with these cases. Iridectomy was done in all and I have had cases of iridectomy alone do as well and must therefore admit that it is possible these cases and others in which the lens was removed with iridectomy may have received the benefit from the iridectomy; but I do not think this to be the case. In these cases *the glaucoma seemed to be gone after the operation*, leaving its awful effects, it is true, but no glaucoma. In the last case cited I feel that the left eye operated in 1920 had a terrific siege to stand during the glaucomatous inflammation and destruction of the right eye, and that the maintenance of placidity and 20/30 vision through all this indicates its condition of well being. Admitting the possibility, that the iridectomy may have caused the good results in these cases or that the removal of the lens was the factor and would be as valuable in glaucoma if the lens were clear, as in partly opaque lenses, I think it is reasonable to inquire in these contrast cases of which I have quoted three although I have had others—

a If the iridectomy was the beneficial factor why did not the same benefit follow an iridectomy (or a Lagrange) skilfully performed in the fellow eye?

b If we assume it was not the iridectomy must we not admit that the removal of the lens was the factor?

c If we think that it makes no difference whether the lens is slightly opaque (in regions likely to impinge through swelling on the circumlental space), or clear, what is the objection to removal of a clear lens if sight seems likely to best be conserved by that proceedure?

Glaucoma is a disease resulting from many different causes. Cataract is recognized as one of the causes but I think insufficiently. Literature gives it scant place. Glaucoma abounds in places where cataract is most common. Elliot[2] says it is "abnormally frequent in India."

Are not many cases called simple glaucoma, cases secondary to unknown swelling of the lens behind the iris? The age incidence of cataract and glaucoma carries suggestion, for lens opacities begin earlier than is generally recognized.

Conclusions

I have no conclusions to state. I only wish to say that I think the lens in glaucoma deserves close investigation.

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THE DIAGNOSIS OF ACUTE OSTEOMYELITIS BY X-RAYS

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An unqualified diagnosis of acute osteomyelitis by X-rays is fallacious. If by acute one understands early, that is twenty-four to seventy-two hours after onset, a positive diagnosis of acute osteomyelitis cannot be made by X-rays for the

FIG. I. Acute osteomyelitis without X-ray evidence of bone changes.

obvious reason that the X-rays do not reveal to our senses the changes taking place during these periods, changes which are, for the most part, microscopical. When a positive diagnosis is offered based on the photographic visualization of bone changes seen in the roentgenogram, it is proof positive that the disease is no longer acute, but rather subacute or chronic, since demonstrable changes do not appear in the roentgenogram sometimes for as long a period as weeks, and certainly not earlier than six days after the onset of a train of symptoms that connote immediate surgical interference.

A negative diagnosis of acute osteomyelitis based on no demonstrable X-ray evidence of bone changes in a patient presenting the classical clinical signs is prima facie evidence of the disease and should complete the surgeon's judgment to operate without delay.

The examination of every suspected case of acute osteomyelitis by X-rays is however a matter of necessity. Its chief value rests in its differential character, to rule out, especially in young children, new growths and fracture, spontaneous or otherwise.

The etiology, pathology and clinical signs of the disease have been a matter of common knowledge for years. The complaint that used to be heard was to the effect that the surgeon did not see this type of case early enough because of the failure of the medical man to differentiate it from sprain and rheumatism. On the other hand, today it would appear that it is the surgeon who often halts when in reality a forced march is indicated.

I have the feeling that the roentgenologist and our method of teaching roentgenology are in a measure responsible. The direct visualization of pathology by X-ray examination in so many cases has by its brilliance, so to speak, blinded us to its limitations. Many of our first rate schools attempt the teaching of X-ray diagnosis in only a desultory fashion. It is small wonder then, if listening in on a current literature that broadcasts for the most part the virtues of X-ray examination that the profession has come to depend overmuch on the method without any proper appreciation of just what positive and so-called negative X-ray diagnosis may really mean.

FIG. II. Repeated X-ray examinations failed to show bone changes. Both surgeon and neurologist agreed on diagnosis of osteomyelitis of third cervical, which was only proved at autopsy.

Because of an increasing number of cases of acute osteomyelitis seen by me during the past year in which it was incumbent to report "no X-ray evidence of bone changes recognized" and which opinion appeared to act as a deter-

rent to the surgeon, it seems imperative to restate the facts in acute osteomyelitis as known today.

Acute osteomyelitis variously termed suppurative or hematogenous is a destructive lesion that involves the periosteum, cortex, marrow and articular cartilage of bone and is, as far as we know it, always a metastatic bacterial infection secondary to some primary focus, known or unknown, acute or chronic, elsewhere in the body.

The offending organism most commonly found is the staphlyococcus pyogenes aureus. The streptococcus, pneumococcus, typhoid bacillus and others are found and produce similar lesions. The essential feature is that the organisms gain access to the blood stream whence they circulate until they find a suitable place to grow, as for instance, a bone recently injured mechanically.

The long bones are affected far more than the others. According to Forbes[1] the most frequent sites of acute osteomyelitis are the upper end of the tibia, the lower end of the femur, the lower end of the tibia, and fibula and the lower or upper end of the humerus. Then the upper end of the femur, the lower end of the radius, the ulna, the bones of the tarsus, the crest of the ileum, and the scapula.

Robertson[2] states that acute osteomyelitis occurs only before the diaphysis is fused with the epiphysis. Forbes believes the disease to be most common between the ages of two and ten while McCallum[3] states cases as being most numerous between the ages of thirteen and seventeen. I have seen it as early as aged two years and one case in a man of sixty-five.

The pathological story as told in the current text books gives the place of origin of the disease as the medullary cavity of the shaft of one of the long bones. At the commencement there are hyperemia and the edema of the medulla so that the marrow is soft and dark red in color. Once suppuration ensues, which is rapid, the marrow becomes streaked and mottled with grey. The cancellous tissue of one or both of the epiphyses usually becomes affected. The disease however is most commonly confined to the medullary spaces. The periosteum becomes edematous and infiltrated with pus and the surrounding soft parts may become the seat of intense inflammatory changes. As a result of these changes, necrosis of greater or less portions of the bone may ensue with the formation of larger or smaller sequestra. Secondary involvement of the joints is frequent. There may be only a serous or purulent exudation or the acute and destructive inflammatory process may extend beneath the joint and produce extensive alterations. In young persons, the epiphyses very frequently become separated from the shaft by the destruction of the cartilage which binds them together. The foregoing is an abridged description from Delafield and Prudden[4] and is characteristic of the common textbook teaching.

Prof. Clarence L. Starr[5] on the other hand, as the result of his studies of early pathologic changes shown from human necropsy specimens, from the roentgen ray findings of cases of longer standing, and some of late cases, and from the correspondence of the findings in the animal experiments, thinks it reasonable to conclude, that, for the most part, infection starts in the metaphysis or diaphyseal side of the epiphyseal line; that it extends most easily along the epiphyseal line to the cortex and the periosteum; that it readily and early strips the periosteum, with increasing tension as more pus is formed; that with increased tension the infection probably spreads backward along through the haversian canals at various levels, and invades the medulla from the cortex.

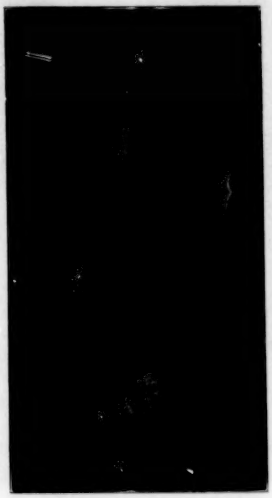

FIG. III. Localized subacute or chronic osteomyelitis with subjective symptoms of only 48 hours' duration.

One should feel that the firm attachment of the periosteum is a safeguard to direct extension to the joint by this route. It is also most unlikely that infection will travel through the epiphysis and articular cartilage direct to the joint.

The neighboring joint is, no doubt, involved in a small number of cases; but I am beginning to believe that it is more often infected secondary to operation, than as a result of primary extension.

This difference is more apparent than real. The explanation for it lies probably in the type of infecting organism The streptococcus is less

liable to produce extensive medullary changes. These foci are usually cortical or periosteal. They seem to prefer the denser areas of bone for growth and locate in the epiphysis or near the epiphyseal line so that joint effusion or

FIG. IV. Osteogenic sarcoma in boy of 15 years with history of injury one week before.

epiphyseal separation are more frequent with streptococcal osteomyelitis. The staphylococcus variety runs the most severe local and general course and when not diagnosed results in massive bone necrosis and pyemia. This distinction was presented by John B. Murphy[6] in 1915 and holds good today.

The clinical signs and symptoms of acute osteomyelitis are fairly constant and easily elicited by proper history taking and inspection of the patient. A history of injury, slight or severe, can always be found whose force is usually localized in the neighborhood of a joint. Recalling that primary osteomyelitis occurs only in compound fractures, the probable source of the secondary disease which we are dealing with should be sought for and may be found in a sore throat or discharging ear or other location far removed from site of trauma. The cardinal signs are increasing pain and tenderness just above or below a joint with constitutional reaction exhibited by fever, rapid pulse and marked leukocytosis with six to eight hours from the first suggestion of pain followed by redness and swelling in twenty-four to thirty-six hours.

These signs and symptoms represent pathological changes that are microscopical, periosteal trauma, blood vessel trauma, medullary odema. Perhaps by the fourth day pus has raised the periosteum. Even if this change could be demonstrated by X-ray examination it would already be too late for bone saving surgery.

A roentgenogram is a photographic visualization of the varying densities of a substance or substances exposed to X-rays. In the case in point, acute osteomyelitis resolves itself into a study of decrease and increase in bone density.

In bone infections, Phemister[7] states, there are four processes by which reduction in bone density may be produced; destruction of dead bone at the seat of greatest inflammatory activity; local destruction of living bone caries; rarefying osteitis in the neighboring living bone for variable distances about the area of complete bone destruction and fourth, there is regional atrophy from disuse.

Necrotic bone results from the effect of the toxins in the most severely inflamed region, he continues. The unossified elements of the dead bone are rapidly killed by toxins and removed by the action of the serum and leucocytes but

FIG. V. Spontaneous fracture through bone cyst with acute symptoms of 24 hours' duration and no history of a fall.

the calcareous deposits are little affected during the height of the inflammation, because practically they are only removed as a reparative process by the absorptive action of the granulations and some time is required for the develop-

ment of reparative changes and the absorption of sufficient bone to produce evidence of reduction in density. From six to fifteen days elapse, depending upon the size of the bone and the location of the infection, before signs of reduction in density can be shown by X-ray. If the osteomyelitis is a diffuse process, the reduced density shows first in small scattered areas of the metaphysis and evidence of involvement of thicker portions of the cortex appears later.

In the cases represented in Figs. I and II, careful X-ray studies were made over a period of weeks before definite signs were seen that represented a reduction in bone density. It is supposed, of course, that we are dealing with X-ray negatives of good photographic value since poorly made ones may not depict even advanced changes.

The diagnosis then must be made on the clinical signs present and an X-ray examination that presents no demonstrable bone changes. The roentgen ray is of no assistance in early diagnosis, says Starr. He does not mean quite that. Its proper evaluation is the crux of the matter. With the clinical signs present and an X-ray examination that shows no positive bone changes, the diagnosis is clinched and surgery is indicated. To wait for bone changes is folly. It is wiser to operate and find to our joy that the patient is suffering from some other infection than to wait and explore only to find our patient overwhelmed by infection. Then too, if Starr's contention is correct, early operation by drilling through the cortex into the subcortical layers of the diaphysis near the metaphysis may forestall the destructive invasion of the medulla which he thinks does not follow until two or three weeks after the original infection.

Again, X-ray examination is of the greatest value in the atypical types of bone lesions near joints that simulate acute osteomyelitis. I have in mind the case of a midshipman referred for question of flat foot, who presented a localized osteomyelitis of the lower extremity of the tibia which because of the amount of bone reduction must have been a process of weeks, but who had only referred pain during a period of forty-eight hours. (See Fig. III.) Also, a boy, fifteen years of age, referred for X-ray examination for suspected acute (?) osteomyelitis, who gave a definite history of a fall one week before. The roentgenogram demonstrated such gross bone changes that it was evident that either we were dealing with a chronic osteomyelitis of many weeks duration or a rapidly growing malignant bone tumor. In the absence of constitutional symptoms that usually accompany acute osteomyelitis and with a history of trauma that did not date back over a week, it was fair to assume that the case was new growth. The diagnosis was made "bone changes consistent with chronic osteomyelitis but new growth must be seriously considered in this patient." (Fig. IV.)

The roentgenologist is often taken to task because he is unable always to be specific in his diagnosis. But it is to be recalled that from a pathological viewpoint there are no specific destructive changes for the individual inflammatory processes in bone disease any more than there are specific productive changes. Tuberculosis, syphilis and new growth at certain times in their life cycle present identical gross pathological appearances as well as identical appearances in roentgenograms. This was brilliantly shown by Lovett and Wolbach[8].

No attempt has been made to offer anything novel here on the subject of acute osteomyelitis, but to restate briefly our knowledge and stress the differential and corroborative value of roentgenographic examination.

To point out that demonstrable X-ray findings of bone changes indicate an infectious process of long standing or rapidly growing bone tumor, and that no demonstrable bone changes in the roentgenogram is the *rule* in acute osteomyelitis.

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SMALLPOX GAINS ENTRANCE THROUGH THE UNVACCINATED

A case of suspected smallpox was reported on Monday, June 16th, from the town of Brooklyn. Upon investigation it was found that a boy ten years of age had typical prodromal symptoms of smallpox on June 8th, 9th and 10th. The boy was one of a family of 9, of whom only the father and the eldest son had been vaccinated. On June 4, the boy felt well enough to be out of doors and played with other children in the neighborhood. Exactly with whom he played he does not remember. On Tursday, the eruption appeared but was not diagnosed and no anti-smallpox precautions were observed.

The boy lived in a thickly populated section of the town where there are many mill workers who have large families. Relatively few of the children are vaccinated.

Further investigation disclosed five other active cases in the town of Danielson just across the river. All of them dated their prodromal symptoms from the same day, June 8, thus indicating a common source of infection.

None of these children had been vaccinated.

YOUR community may be the next in which smallpox makes its appearance.

ANY COMMUNITY CAN PROTECT ITSELF AGAINST EPIDEMICS OF SMALLPOX BY VACCINATION.—*Connecticut State Department of Health.*

THE RAPIDLY DISAPPEARING STATE HOSPITAL PATHOLOGIST

BY OTIS F. KELLY, M. D., PATHOLOGIST, DANVERS STATE HOSPITAL

In the proceedings of the American Medico-Psychological Association in 1919, there appears a report of the committee on pathological investigation which sets up certain requirements as to housing, equipment, full time pathologists, technicians, autopsies to the number of twenty-five percent of the total deaths and photographic facilities as the basic requirements for "class A" laboratories. In a classification of state hospital laboratories suggested by the committee, among 155 state hospitals and two federal institutions in the United States, only eighteen laboratories were found which met these requirements, and eight which met them with the exception of photographic facilities or a high enough percentage of autopsies. These statistics were gathered by that committee in 1919 with the fact in mind that the period was one of re-adjustment and reconstruction and was an opportune time to focus attention on the need for the further development of laboratory facilities in hospitals for mental diseases. Five years later, in 1923, a similar committee of the same association, now the American Psychiatric Association, conducted a similar investigation. Among 181 hospitals in the United States and Canada, they could now find only nineteen which would fulfill all the requirements. This certainly does not seem to indicate that the development of laboratory facilities in mental hospitals, so earnestly desired by the committee five years before, had begun. In 1919, the committee was able to tabulate forty-nine hospitals with positions for full time pathologists, many of which positions were vacant. Five years later, in 1923, the committee found only forty-eight hospitals in the United States and Canada reporting positions for full time pathologists, of which sixteen positions were vacant, leaving, according to the census of the committee, a total of twenty-eight mental hospital pathologists in the United States and Canada. This again does not indicate that the hoped for development of pathological work had appeared at the end of five years after the war, but rather indicates that some of the laboratory facilities that had been present before had disappeared.

Even without these figures, I think that few engaged in the practice of neuro-psychiatry would entertain any doubt as to the decline of this once promising branch of the specialty. Certainly this society in the discussions at its meetings hears less about pathology than they did a few years before the great war began. There are now in Massachusetts four state hospital pathologists, one of whom is just starting a laboratory. There are at least three Massachusetts state hospitals with well equipped laboratories, with no pathologists to conduct them.

In 1919, the committee of which I spoke made an attempt to ascertain by inquiry the opinions of the hospital officials as to obstacles in the way of the development of laboratory work. The obstacles in the order of their frequency as reported were first, a lack of financial support and inability to get trained men at the salary offered; second, the inability to get trained men even when the salaries offered were favorable; third, the difficulty in getting autopsies because of statutory restrictions in two or three states and because of public sentiment elsewhere. Five years later the obstacles as reported were much the same. In 1923, the committee closed its report with the suggestion that the American Psychiatric Association give certificates of approval to laboratories which met the basic requirements; but especially the committee urged a full and frank discussion of the problem presented by the decline in laboratory activities during what is spoken of as a period of reconstruction. The resultant discussion was the adoption of the report without a word from the floor. At the Round Table Conference on Laboratory investigation at the same meeting there were only nine present and it was remarked there that the number was indicative of the interest in laboratory work.

The obstacles to the development of laboratory work in mental hospitals as given in these two committee reports seem to me to be utterly inadequate. Evidently Dr. Ruggles thought there must be a deeper cause for the decline when he asked me to prepare this paper. I did not find the subject so simple as it first appeared and it seemed that the waning of interest in pathology must indicate a flaw in the groundwork of psychiatry. I therefore began to look through the reports of the meetings of the American Psychiatric Association with its parent societies, the American Medico-Psychological Association and the American Association of Medical Superintendents for Hospitals for the Insane, with the idea of tracing the development of pathological activity in the mental hospitals of this country.

The association, as you know, began in 1844, with a membership of thirteen superintendents of mental hospitals. At the first meeting a committee of three were appointed on post mortem examinations and at the second meeting, in 1846, after their report, it was resolved that the members of the association make post mortem examinations in all cases where it was possible and to report their observations at the next meeting. At the third meeting, in 1848, pathological reports were made by eight superintendents, many of whom apparently did the autopsies themselves. Pathological data is then scant in the reports of the association until the years 1855 to 1860 when again they occupy a prominent

place, having their impetus chiefly from Dr. Workman, Superintendent of the Toronto Asylum, whose papers indicate that he was not only an outstanding administrator, but also an active pathologist. Again for about twelve years pathological reports are few in the meetings of the association until in 1872 they received another impetus from the activities of Dr. John P. Gray, who founded the first state hospital laboratory in this country, at the Utica, New York, Asylum. For a few years again pathology was prominent in the proceedings of the association and again pathological discussions became few and far between, until in 1882 the association appointed its first standing committee on cerebro-spinal pathology. In 1889 there appears much discussion of the question of adopting a uniform system of reporting autopsies in mental hospitals. About five years later pathology came to the fore in New England with the establishment through the efforts of Dr. Page of a laboratory and position of permanent pathologist at Danvers, occupied by Dr. Alfred Worcester; a year later with the appointment of Dr. Adolph Meyer at Worcester State Hospital; and two years later of August Hoch at Waverley. This may be thought of as the beginning of the last era of pathological activity and in New England the names of Worcester, Barrett and Southard at Danvers, Adolf Meyer at Worcester, August Hoch at Waverley and Solomon Fuller at Westboro, require no more than mentioning to a New England audience of psychiatrists to recall the memory of a glorious period for pathology.

It is not my purpose, in thus sketchily reviewing the history of state hospital pathology in America, to appear as a praiser of times past, but no one will deny that a decline in this once promising and prominent branch of our specialty has taken place, and doubtless the object your president had in mind in bringing up this subject today was that attention might be called to this decline, the reasons for it discussed and the possible remedies for it considered. It is, I think, obvious that the absence of interest in the pathology of the psychoses is, in part at least, due to the fact that pathology has failed to satisfactorily explain on an anatomical basis the symptoms of such diseases as dementia praecox and manic depressive insanity, and the plausible theories for their explanation which have been advanced by the newer developments of psychology. As early as 1854, there appears the first discussion in the proceedings of the American Association of Medical Superintendents of Hospitals for the Insane on the question of the physical or psychical origin of insanity, otherwise known as the "structural or functional" origin. These discussions appear ever since in psychiatric literature and still appear and the word "versus" in the titles of paper after paper on the subject indicate the controversial manner in which it has been approached, and most discussions on such a subject as this seem to be reduced to debates on the "structural or functional" origin of mental disease. I hope to avoid that. It is interesting to notice, however, that in some of these older discussions, not by pathologists, but by superintendents, opinions on the functional origin of mental diseases were based chiefly upon pathological study and the absence of discoverable lesions.

With the rise of psycho-analysis the "functional theory" appears to have gained the ascendency in this apparently unending argument. Physicians entering psychiatry hear a great deal about the functional origins and their mechanism, and very little about the accompanying pathology, and they gain the impression on entering our specialty that pathology has done little or nothing in clarifying the problems of psychiatry. Certainly pathology has not taught us the origin, or the nature, or the treatment of all the psychoses, but if one studies the evolution of the conception of general paresis one learns that its recognition as a separate entity was first brought about by the coördination of post mortem findings with the clinical symptoms. Even this alone is something, as I was impressed with when during the last few weeks I heard one of your number, not so very old either, recall in casual conversation the time when the continual jolting on railroads was given as the essential cause of general paresis in engineers. Pathology has clarified the distinction between senile dementia and cerebral arteriosclerosis; pathology has separated general paresis from cerebral syphilis; pathology has made more accurate the symptomatology of brain tumors; pathology, judging from the conclusions in the Waverley Researches by Drs. Southard and Fernald and their associates, is teaching us that some 40% of mental deficiency is probably traceable to physical disease in early life rather than to germ cell deficiency. Pathology too has taught us the post mortem signs in some of the hereditary progressive degenerations, such as progressive muscular atrophy and Huntington's Chorea and it is not unreasonable to suppose that comparison of these findings and the findings in certain cases of the so-called endogenous psychoses may teach us whether or not certain cases of the latter class may be types of hereditary progressive degenerations on higher biological levels. With such facts in mind it is hardly scientific to ignore pathology on the ground that most psychoses are "functional." Pathology should not be expected, necessarily, to furnish thereapeutic measures in mental diseases. That is a task for clinical psychiatrists, who know whatever there is to be known about the pathology of the psychoses, and, as I shall try to bring out more clearly, the importance of the pathologist is in the preservation of and adding to such knowledge and making it available to the clinical psychiatrist.

Also to be considered in relation to the decline of state hospital pathology is the fact that physicians outside of our special field are not attracted to pathology as formerly, and I presume that the reasons for this are much the same as the reasons for the decline of state hospital pathology. For any science in the brilliancy of its first achievements is more attractive than later when it settles down to the preservation of acquired knowledge and the slow and laborious addition of detail. That the decline of interest in general hospital pathology is also attracting attention is made plain in a paper by Dr. Ludvig Hektoen before the Annual Congress on Medical Education, Medical Licensure, Public Health and Hospitals, at Chicago, March 5th, 1924 (J. A. M. A. Mar. 22, 1924) in which he speaks of the influence of the necropsy on medical progress past and present, the necropsy in investigation, the necropsy as a help to the maintenance in the physician's mind of objective conceptions of relations between symptoms and diseased structures, and hospital efficiency in general. These things apply also to pathology in mental disease and there are added reasons for pathology in state hosptials. In most other specialties the practitioner daily sees the normal and abnormal anatomy and physiology of the parts in which he is interested while the psychiatrist is extremely limited in the methods at his disposal of examining in life the organ with whose activity he is chiefly concerned. This is true of almost every other specialty except internal medicine and most successful internists have passed through their apprenticeship in pathology or frequent the pathologist's headquarters.

As for many other reasons, which occur to one, such as the lack of interest of his colleagues in the work of the pathologist, the financial remunerations, the traditional feeling of antipathy which for some reason, no doubt petty, has grown up and persisted between pathologists and clinicians of mental hospitals, I do not consider any of them important, and will pass over them to try to indicate what I think may lie at the bottom of the problem.

It is now many years since the European laboratories, and particularly the German laboratories, gave to psychiatry their many painstaking works on the pathology of the brain in mental diseases and sent their students through the world disseminating the knowledge gained with them, and instituting similar work in the laboratories of this country. At the same time, general paresis was recognized as an entity, and its cause was discovered and proven. As the happy combination of Louis Pasteur's genius and the perfection of the microscope and other instruments of precision concurred to give to the world the brilliant chemical and biological discoveries which revolutionized medicine, so, also, the genius and personality of Southard, appearing in this country on the crest of this wave of investigation and discovery in neuro-pathology, made the pathology of the psychoses for a time the most prominent and attractive department of psychiatric discussion. Pathology, however, did not continue to bring forth spectacular achievements and, unfortunately, there was not established any system which would insure the diffusion of knowledge of the established discoveries of neuro-pathology among physicians newly entering psychiatry. This is evident at once when one considers that the medical student and the young psychiatrist today have not even a textbook available in which they may find what has been discovered in regard to the pathology of the psychoses, but if they wish to inquire into the subject they must needs perform the nearly impossible task of exploring an ocean of literature for what they want to know. In the meantime, training in administrative and sociological subjects became a part of the routine of the state hospital physician's life, and rightly so. The physician entering the state hospital finds his entire time taken up with a busy routine which often includes, not only necessary administrative tasks, but many other tasks connected with innovations which are not always strictly medical in character, and it is to be regretted that no system is met with whereby the psychiatrist in training, so to speak, learns first the fundamentals of his chosen profession (and pathology surely is part of the foundation upon which any branch of medicine rests) before he is plunged into the enthusiastic activity of later innovations, sometimes of as yet unestablished value.

"New thinkers," I read in a non-medical review recently, "too often means people who have not taken the trouble to learn what older thinkers thought." In this connection, you can find in the Proceedings of the Tenth Meeting of the Association of Medical Superintendents of American Hospitals for the Insane, in 1855, (seventy-nine years ago) a lengthy discussion concerning the influence of diseased teeth and gums and digestive organs, whose "diseased state" the paper under discussion says "might perpetuate, even cause insanity." Incidentally the author of the paper which precipitated the discussion was the then superintendent of the Hospital for the Insane at Trenton, New Jersey.

History is filled with the re-discovery or reformulation of forgotten discoveries and theories, and if the establishment of pathology as a permanent part of the foundation of American Psychiatry is desirable, it cannot be brought about while the pathologist is expected to be the "research man" for the hospital. The source of state hospital pathologists must be found in the young physicians entering psychiatry as a profession and not as a transient occupation. Their work need not be spectacular, but, as I have tried to indicate, should consist, in addition

to conducting the laboratory, chiefly of the quiet preservation of, and slow addition to, knowledge already gained. From their ranks, in turn, must come the psychiatrists whose convictions on the nature, origin and treatment of diseases rest upon the firm foundation of a knowledge of pathology. The establishment of such a system must necessarily be a problem of medical administration. I would not have you think that I am under misapprehension of the diversity of tasks in the daily life of the medical superintendent, especially at the present time, but in considering this very sketchy outline of the development of state hospital pathology, it is evident at once that the interest in pathology has recurred in phases stimulated by the intelligent interest of those who ultimately are the leaders of psychiatry in America, namely, the superintendents of mental hospitals, and even in the brilliant period of pathology of which Danvers was the prominent focus and Southard the outstanding leader, it was Dr. Page who made the place which Southard filled. If then a decline has occurred, if the supply of pathologists is diminished or disappeared, if young men are not attracted to pathology, and if well equipped laboratories lie dormant for the absence of a pathologist to conduct them, as they do, the remedy must come from the same source from which the original stimulus came, from the leaders of psychiatry and must be maintained by their example.

CHRONIC TRIONAL POISONING: REPORT OF A FATAL CASE

BY CLARA LOITMAN, M. D.

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THAT trional is a hypnotic is well known, but that it may cause poisoning and death is not so well known. This is not surprising because knowledge of, and familiarity with a given condition is in direct proportion to its frequency, and trional poisoning and death therefrom is rare. A fairly careful review of literature revealed very few fatal cases since 1900. Putnam[1] in 1900, Rosenfield[2] and Church[3] in 1901 and Rogers[4] in 1912, each reported a death from chronic poisoning, and Mumford[5] in 1922, one, from acute poisoning. In 1901 Kingsbury[6] reported the death of a morphine addict who had been using trional over a prolonged period of time. Because of the comparative rarity of fatalities from trional, it seems of interest to present this case.

Mrs. M. B., age 44, housewife, entered the Massachusetts Homeopathic Hospital on February 26, 1924.

C. C. General weakness and abdominal discomfort especially about the umbilicus.

F. H. Good.

M. H. Duration 17 years. Husband living and well. 3 children living and well. 1 died in infancy. No miscarriages.

Habits: Sleeps poorly. Drinks tea and coffee sparingly. Denies the use of alcohol. Admits taking 15 grains of trional every night for the past two years and of having taken 30 grains frequently for the past few weeks. She says that the drug was prescribed by her physician because of insomnia and nervousness.

P. H. Born in Ireland. Has been in this country for 22 years. Had measles in childhood and a "nervous breakdown" about a year ago. Gives no history of other diseases, injuries, operations or previous hospital entries, but states that she has never been very strong. Has always been more or less nervous. Has an occasional mild frontal headache. Has been wearing glasses for many years but vision has been failing lately. There were no menstrual disturbances until four years ago. Since then the periods have been irregular occurring once in five to seven months. Last period February 13, 1924.

P. I. Since the "nervous breakdown" one year ago, the nervousness and insomnia have been more troublesome. For the past two weeks she has felt extremely weak, has had nausea, vomiting and a constant dull pain and discomfort about the umbilicus, at times extending throughout the abdomen down to the pubic region and to the shoulders, has belched gas and has been very constipated. There has been frequency of urination and the urine has been pink to red in color. There has been palpitation and dyspnoea on slight exertion.

Physical Examination: A well developed, poorly nourished white woman, stuporous and dazed and apparently very weak. Answers questions sluggishly and indistinctly. Speech is thick.

Mouth: Teeth very dirty, many missing, moderate pyorrhoea. No tonsillar or faucial inflammation.

Neck: Negative.

Thorax: Symmetrical. Expansion equal on both sides.

Lungs: Negative.

Heart: Apex beat palpable in the fifth interspace one cm. inside the mid-clavicular line. Heart sound of fair quality and regular. No murmurs heard.

Abdomen: On level with thorax. Tympanitic.

No rigidity, tenderness or palpable masses. Liver, spleen and kidneys not palpable.

Extremities: No edema.

Genitalia: Perineum—good support. Urethra and vaginal walls negative. Cervix of normal size and consistency. First degree laceration on the left side. Third degree retroflexion of the fundus. No masses or tenderness in the vaults.

Neuro-Muscular: Pupils of moderate size, equal and regular. React to light and distance. Nystagmus present. Knee jerks decreased and equal. No Babinski or ankle clonus. Trembling of facial muscles and of arms and hands. Staggering gait. Memory fair.

Blood Pressure: 155/110.

Temperature: 98-99.2.

Pulse: 90-105.

Respiration: 20-28.

Urine: Sample sp. gr. 1.016. Color: Red. Acid reaction. Very slight trace of albumen. Sugar: 0. No red blood cells. Many hyaline and finely and coarsely granular casts. Spectroscopic examination made by Dr. Mendenhall of the Evans Memorial showed the presence of alkaline hematophrin with the four absorption bands, one midway between C and D and the second across D, the third between D and E and the fourth between B and F. The urine was prepared in the usual way[7] for the detection of this pigment.

Blood: Hgb. 75%. Leucocytes 7900.

Wasserman: Negative.

Orders: February 27: Morphine suppository Gr. ¼
Soda Bicarbonate Gr. 15
every three hours
Triple Bromides Gr. 15
(repeated)

February 29: Morphine suppository Gr. ¼
Triple Bromides Gr. 15
Allanol Gr. 2.66

In the evening of entry, the patient was seen taking powders which she had under her pillow. She reluctantly gave them to the nurse who asked her for them and refused to tell what they were. The powders were shiny, colorless, odorless and practically tasteless. They were suspected of being trional or sulphonal and a test[8] for these drugs was made by heating the substance with iron and the characteristic garlic odor was obtained.

The fact that the drug was trional was verified by communication with the Pharmacy whose name appeared on the box and was later admitted by the patient.

During the hospital stay the patient was extremely weak and most of the time lay in a stuporous, dazed state, but answered when spoken to. She was physically and mentally depressed. At times she would suddenly completely disrobe, tear the bed clothes apart and get out of bed. She mumbled to herself and very frequently asked for her clothes so that she might go home. She slept very little even after morphine was given. She took semi-solid diet fairly well, but complained of nausea and most severely of the constant abdominal distress, especially about the umbilicus. She vomited a little. At no time was there abdominal tenderness or spasm. Bowels did not move except with enemas. She frequently voided small amounts of urine which was orange to red in color, and on the third day she complained of dysuria. Had chilly rigors without rise in temperature. The exhaustion became more marked, the pulse weak, though regular. On March 3, she became irrational and delusions were elicited. On March 4 she was transferred to the Psychopathic Hospital.

Abstract from the Boston Psychopathic Hospital Record: "Physical examination shows a woman on the verge of collapse, with urinary retention. Right pupil irregular. Heart action weak. No temperature or leucocytes. She is confused and lies in a stuporous condition from which she can be roused with difficulty. Past and present memory are grossly impaired. Delusional content not elicited. Collapse during examination. Urine: Color, clear Bordeaux red—Sp. Gr. 1.018—Reaction—acid. Albumen, trace—Sugar, 0—Showers of hyaline casts, occasional granular cast, rare cell cast. Whatever the underlying condition is, we seem to be dealing with a profoundly intoxicated individual with presumably an exogenous poison. Diagnosis: Psychosis due to drugs. Patient died on March 6."

REPORT OF FINDINGS IN AUTOPSY ON BODY OF MRS. M. B., BY DR. WILLIAM J. BRICKLEY, MARCH 7, 1924

Body is that of a white woman, 5 ft. 10 in. tall, weight 111 lbs. Fine granular freckles about eyes, eyelids, malars, nose; most marked about the eyes and lids. Pupils equal, .4 diam. Sclerae not injected. Brown eyes. Parturient nipples. Abdomen shows old pregnancy scars. No external marks of violence except at fold of left arm where there is an ecchymosis due to needle puncture of left median cephalic.

Abdomen fat, light yellow. 1 cm. thick. Muscles thin, red. Liver 3 cms. below ensiform; dark slate color. Diaphragm right, 4th interspace; left 4th interspace.

Stomach and colon dilated. Some folds of intestines in upper portion are greatly dilated. Inferior portion contracted. Intestines in latter injected. Appendix is atrophied; 3 cms. long; flat type; runs from .5 to .2 cms. thick. Uterus in complete retroflexion and retroversion; all of the intestines are superior to the uterus.

Pleurae are clear; lungs voluminous. Heart is moderately dilated. Small amount of fat

around heart. Pericardial sac contains no fluid. There are many peri bronchial glands. Heart contains many dark red clots. Inferior border of stomach presents many varicose veins.

Mesentery of ascending colon presents many hard, calcareous glands, Pea to Lima bean in size. Mesentery is thin and tough. Numerous glands in upper portion of intestines. Mesenteric vessels are dark colored, engorged. Blood clots are dark.

Right kidney is movable; has an up and down excursion of 3 inches. Adrenals on right are large, soft, black. Left adrenal is twice the size of the right. Cortex of left is tough; medullar brownish. Right is somewhat smaller than left but both are larger than usual. No marks of violence or injury on or in the chest. Ribs intact. Over the 10th rib at its junction with the spine there is a thickening of the bone which is smooth, old, and involves the rib for a distance of 3 inches from its head. It is apparently an old dislocation. Rib is out of alignment.

Bladder contains 1 drachm of light brown, yellowish, thick, viscid urine. Vessels of mucosa are injected. There is a pocket in the left side of the bladder, 3 x 2 cms. in which there are old trabeculae. Tissues are friable.

Left ovary is hard, flat. Right is much the same. Uterus measures 10 x 6 x 4.5 cms. Uterus is rounded, hard, tough. On section the uterus is light colored, fibrous, smooth. Fundus is but a small space.

Aorta smooth and elastic throughout.

Head: No marks of injury present. Scalp .6 cm. thick. Dura lightly adherent. Calvarium intact; anterior thickness, .6 cm., posterior the same. Diploe is increased. Gyri flattened. Dura adadherent at vertex. Posterior meningeals injecte anterior, not. Basilar vessels show a small number of light yellow patches. No distinctive odor in brain. Middle ears natural, but show a small amount of blood congestion. Base is natural.

Brain: On superior surface of the cerebellum the meninges are light pinkish gray. Ependyma thick; pale. There is a small amount of fluid in the ventricle. In the meninges over the anterior portion of the 4th ventricle there is a mass, clear, light-grayish cyst, measuring 1 x .8 x .3 cms. Brain is somewhat moist. Puncta prominent. Brain substance is white, pearly gray. No focal areas other than cyst and meninges.

Heart: Right auricle has a large amount of chicken fat clot of dark color. Thickness of right ventricle, .8 cms.; left ventricle 2 cms. Tricuspid valve 12.2 cms. Pulmonic valve 7 cms. Mitral valve 9.5 cms. Aortic valve 6 cms. Coronaries patent. Muscle soft, light brownish, uniform. Curtains show severed reddish yellow plaques, especially in the mitral.

Lungs: Left is downy in upper lobe; lower lobe quite firm. Lower lobe contains light pinkish froth; vessels are moderately engorged. No open areas present. Section of upper lobe floats. Bronchi clear. Right middle lobe voluminous and crepitant. Upper lobe voluminous but not so crepitant. Lower lobe is light salmon red; on section presents numerous dark red areas. There is an abundance of froth. Bronchi in upper lobe are thickened.

Spleen: Light slaty gray. On section, dark magenta. Pulp is soft; markings distinct.

Liver: Dark slaty brown; substance soft. On section, markings indistinct; yields abundant dark tarry blood. Gall bladder empty. Liver is uniform throughout.

Kidneys: Left; capsule is light pearly gray mixed with brown. On section papillae and cortex are injected. Cortex, .8 cms. Papillae are deep purplish around periphery. Center is light pinkish, opalescent; tough. In the papillae and in the cortex at various spots there are areas of light brownish coloring. Section of papillae shows a pearly-gray color. Substance tough; capsule when stripped leaves a smooth, granular surface. Vessels remain open when cut. The inferior pole of the right kidney is dark purplish under the capsule. Cortex, .6 cms. Papillae present numerous light grayish areas; necrotic when scraped. Blood vessels distended; prominent. Centre, opalescent tough. Blood vessels in cortex not distinguishable.

Stomach: Contains 450 cc. of light brownish fluid mixed with curds—milk—recently ingested. Contents bear the odor of milk. Mucosa is natural near the oesophagus; inferior portion is dark purple and is overlaid with glairy mucus (low-grade of gastritis).

Pancreas: Is light pinkish; small; tough.

Intestines: Upper ileum contains a small amount of material similar to contents of stomach plus a large amount of gas. Mucosa is somewhat injected; small vessels are prominent. Lower ileum the wall is thick; vessels prominent and contain light particles of red in between. Cecum contains a small amount of yellow feces and patches of yellow material of pea soup type with bismuth enema. Mucosa of ascending and transverse colon lie in rugae—(chronic colitis). Rugae are very thick.

Anatomical Diagnosis:—

Moist brain.
Thick meninges. Cyst.
Dilated heart. Dark clotted blood.
Chronic endocarditis.
Dilated tricuspid.
Oedema and congestion lungs.
Chronic bronchitis, right.
Chronic gastritis.
Chronic inflammation and thickening lower ileum.
Calcareous glands left mesentery.
Chronic colitis.
Retroflexion and retroversion uterus.

Chronic cystitis.
Atrophied ovaries.
Interstitial nephritis.
Sclerotic kidneys.
Congestion of spleen, liver and kidneys.

Weights:—

Left lung, 475 gm.	Right lung, 565 gm.
Spleen, 125 gm.	Liver, 1935 gm.
Kidneys, 260 gm.	Heart, 255 gm.
Brain, 1400.	

Death Certificate:—

Acute pulmonary oedema due to cardiac failure associated with anaemia from self-administered drug. Accidental. Chronic cerebral meningitis.

(Signed) WILLIAM J. BRICKLEY.

It was later learned that the patient had what appears to be attacks of depression in April, 1923, and again in September, 1923. With both attacks there were gastro-intestinal disturbances, vertigo, weakness, insomnia and despondency. During the attack in September she was admitted to the Adams Nervine Asylum. The past history obtained at that time compared favorably with that obtained at the Massachusetts Homoeopathic Hospital. One gross difference was the ages of her parents, at that time being given as 62 and 65, and in our hospital as 76 and 80. This is doubtlessly due to memory impairment. She had been using trional for several months previous to the entry in Adams Nervine Asylum.

When the usual examination was attempted in the latter hospital the patient became excited and refused to let the examination go on. She said that she was afraid and wanted to go home. She went home and was re-admitted two days later. Two days later at an early hour in the morning she came in from out of doors. It was impossible to find how or when she went out. It later developed that she told the patients that she was afraid she would throw herself from the window and that was why she did not want to stay inside. The patient was discharged that day as insane. She had been admitted on the certificate of a physician who stated that she was not addicted to the use of drugs and made no mention of the trional. Whether these attacks were precipitated or influenced by the trional is open to question.

During the interval of discharge from the Adams Nervine Asylum and entry into the Massachusetts Homoeopathic Hospital the patient was keeping house and apparently was considered mentally normal by her family. She was referred to our hospital by an outside physician whom she consulted a short time previous to the hospital entry, who suspected a surgical condition of the pelvis or abdomen. He did not know that she was addicted to the use of trional.

Her symptoms, gastro-intestinal, urinary and nervous, included practically every symptom attributed to and described in trional poisoning. The patient was approaching the climacteric and the menstrual irregularities are those which might be expected at such a time. Bresslauer and Joachim[9] while using trional over a long period of time in a large number of cases observed gastro-intestinal disturbances, giddiness, weakness and ataxia of the lower extremities. Hart[10] and Von Noorden[11] each reported a case where nausea, vomiting, abdominal distress, constipation, renal irritation, vertigo, depression and exhaustion occurred after the rather prolonged use of trional. In all these cases there was relief from symptoms soon after withdrawal of the drug. Similar symptoms were observed by Schultze[12] who reported the first fatality from trional and by Morro[13] who demonstrated the cumulative action of the drug. The only other case in my review in which nystagmus was noted was reported by Barany[14] in 1913.

The most distinctive feature is the hematoporphyrin in the urine. In minute traces this pigment occurs as a constant constituent of normal urine. It is occasionally met with in increased amounts in various diseases, usually without any obvious change in the color of the urine. More frequently it is met with in drug intoxication (usually sulphonal or trional) where the drug has been used over a prolonged period of time and is associated with a change of the color of the urine to Port wine or Bordeaux red. When the hematoporphyrin is established in these toxic cases the prognosis is discouraging. It was observed in the fatal cases, Rosenfeld, Church, Rogers and Putnam. The latter questioned the cause of the hematoporphyrinuria because it continued for 13 days after the drug was discontinued. The last dose of trional was taken by Mrs. M. B. on February 26 and on March 6, 9 days later, the urine was still Bordeaux red. Because of the cumulative action[15] of the drug it is possible for it to exert its influence even after it has been discontinued.

An ante-mortem diagnosis of multiple neuritis was made in Putnam's case and at autopsy a degenerative neuritis was found. Autopsies in the other fatal cases failed to disclose anything particularly noteworthy.

This case demonstrates the importance of inquiring as to the previous medication received by a patient because, but for the routine hospital history and the chance finding of the drug, a diagnosis in the case of Mrs. M. B., because of the complexity of the symptoms, would have been extremely difficult. It also points out the possible dangers of a drug generally considered perfectly safe, and the importance of cautioning patients as to these dangers.

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THE PLACE OF ARTIFICIAL INSEMINATION IN THE TREATMENT OF STERILITY

BY SAMUEL R. MEAKER, M. D., M. R. C. S., BOSTON

THE idea of artificial impregnation has been entertained for centuries. As far back as 1322 it is reported to have been carried out successfully in mares by the Arabians. The eggs of fishes were artificially fertilized in 1700, and in 1780 Spallanzani succeeded in impregnating bitches by artificial means. Today such methods have a recognized place both in pisciculture and in the breeding of domestic animals.

In 1799, John Hunter injected the semen of a husband with hypospadias into the vaginal vault of the wife, and conception followed. Artificial intrauterine insemination in the human was first done by J. Marion Sims, whose only successful case (out of six patients) occurred in 1866.

The publication of this case aroused great interest, and in the following twenty years the method was widely used in Europe, and to a lesser extent in this country. A considerable literature upon it accumulated. Almost from the start, however, objections began to be raised against it not only on medical, but also on moral, social, and even legal grounds. Sims, writing in 1886, says "I have given up the practice altogether, and do not expect to return to it again." He records his experiences as a "guide to future observers, who may have the curiosity, leisure, courage, and perseverance to experiment further in this direction."

One factor contributing undoubtedly to the early abandonment of these attempts was the comparatively small number of successful results. This in turn was due to a very imperfect appreciation of the indications for artificial methods. The general feeling was that they might well be tried as a last resort when all else had failed, or when no gross cause for the sterility could be discovered. Naturally under such circumstances success was rather the fortunate exception than the rule.

INDICATIONS

It is commonly believed that in normal coitus the semen is deposited in the posterior vaginal vault, or receptaculum seminis, and that spermatozoa find their way into the uterus subsequent to ejaculation. They are variously supposed to be sucked up by spasmodic contractions of the organ, and to climb by their own motility the strings of mucus, or Kristellerfaden, poured out by the cervix during sexual excitement. The evidence supporting these ideas is not convincing.

On the other hand, it is well known that in the ordinarily acid vagina the life of spermatozoa is very brief. Postcoital examinations show diminished motility and many dead forms within a few minutes after ejaculation. My own observations are wholly in agreement with the conclusion of Huhner that fertilization is most unlikely unless semen is ejaculated directly into the cervical canal, or at least onto the os externum. If that is so, then there appear at once a group of conditions responsible for sterility on mechanical grounds because direct insemination of the cervix does not occur.

On the male side various possibilities include impotentia coeundi, premature ejaculation, hypospadias, and stricture, as well as disproportiate shortness of the penis. In the female such positions of the uterus as tip the cervix markedly forward may operate to prevent insemination. Two conditions of this sort are fairly common. In the long conical anteflexed cervix characteristic of pelvic hypoplasia the os externum is frequently in contact with the anterior vaginal wall. A similar relation is seen when the uterus is in extreme retroversion without any great degree of retroflexion. Less commonly encountered conditions preventing natural insemination are vaginismus, and general redundancy of the vaginal walls.

In another group of cases insemination of the cervix is naturally accomplished, but various hostile factors in the cervical canal prevent living spermatozoa from reaching the uterine cavity. The trouble may be mechanical, chemical, or bacterial. The commonest mechanical difficulty is the presence of a thick and tenacious mucous plug through which the spermatozoa cannot penetrate. Stenosis of the cervix by itself is no obstacle to the ingress of spermatozoa, but stenosis may result in the formation of such a plug from faulty drainage of the cervical secretions. The acid cervix is actively hostile to spermatozoa. Endocervical acidity may be due to a systemic acid diathesis, or to local infection with any of several acid-forming bacteria. In addition, marked endocervicitis without acidity may have a cytolytic action on spermatozoa, though frequently such is not the case.

Thus we have a considerable list of conditions

which can operate to keep spermatozoa from reaching the supracervical genital tract. If any of these can be remedied, and many can, so that natural insemination becomes possible, that is obviously the procedure of choice. Some of them are, however, extraordinarily obstinate, and resist all efforts at correction. In such cases artificial insemination offers an easy means of overcoming the obstacle, and is a method seriously to be considered.

There are two essential prerequisites to the use of this method: (1) the semen must be perfect as regards number, motility, and morphology of the spermatozoa; and (2) the female genital tract above the cervix must be normal. Unless these conditions are fulfilled there is neither use nor sense in attempting artificial impregnation.

If these conditions are satisfactory, then we may sum up the indications for artificial insemination by saying that it is a method, and often the easiest method, of treatment in two general groups of cases: (1) those in which there are mechanical factors preventing natural insemination of the cervix; and (2) those presenting a cervical condition sufficiently inimical to spermatozoa to prevent them from reaching the uterine cavity after they have been properly deposited in the cervix.

TECHNIQUE

By many of those using artificial insemination the details of technique have been worked out with an elaboration which appears to me largely unnecessary. The only essential thing is that normal and undamaged spermatozoa be introduced into the female genital tract above the point where difficulties or dangers stand in their way.

If artificial methods are used to overcome a mechanical obstacle and the endocervix is normal, then an injection into the cervix is satisfactory. If, on the other hand, there are present cervical conditions hostile to spermatozoa, it becomes necessary to inseminate directly into the uterine cavity. The only reason for not using the latter method as routine in all cases is that the alkaline secretions of the cervix may possibly have an actively beneficial effect on spermatozoa. Of this I am not convinced, though some writers lay great stress upon the point.

It is usually most satisfactory to carry out the procedure at the patient's home, if for no other reason, then because in that way fresh seminal material is available. The time of choice is immediately after the termination of the menstrual period.

With the patient in the dorsal gynaecologic position, the cervix is exposed with a bivalve speculum, and is wiped dry. It may be steadied if necessary by a tenaculum. If an intrauterine injection is contemplated, it should have been ascertained at a previous examination that the os internum can be easily passed by the cannula that is to be used.

The syringe, which should be graduated in minims, is equipped with a fine cannula long enough to pass, if necessary, well above the os internum. Both syringe and cannula are warmed, by immersion in water, to body temperature. While this is done the tip of the cannula is guarded by a cork in order to keep water out of the instrument.

The semen is drawn up from the condom into the syringe, and the cannula is inserted into the cervical canal or uterine cavity. Not more than two drops should be injected, as larger amounts are unnecessary, and are likely to evoke uterine colic. No special after-treatment is required.

The procedure must be repeated at monthly intervals a great many times before it can fairly be considered a failure in a given case. When one considers that two perfectly normal people may have coitus two or three times weekly for months before pregnancy occurs, it is obvious that on the law of chances considerable perseverance with artificial methods may be necessary. It is just as well in most cases to explain this to patients at the beginning. The important thing is to be sure that the case is properly chosen, as otherwise any amount of perseverance is merely wasted effort.

REPORT OF A CASE

Mrs. I. F. consulted me for sterility in August, 1923. No pregnancy had occurred during the seven years of marriage. The wife was 32 years old; her past history and general health were good, and there was no obvious fault in her hygienic habits. Her menstrual behavior was not in any way remarkable. The sex-life of the couple was normal, with mutual desire and satisfaction.

General physical examination of the wife showed no abnormality. The routine pelvic examination was negative except for two items: (1) the vagina was unusually long and its walls were redundant and lax, so that there was some difficulty in exposing the cervix with the bivalve speculum; (2) the cervical canal was filled with a thick and tenacious plug of mucus. The patient volunteered the statement that the penis in coitus had never penetrated as far as did the examining finger.

Further special tests of the wife were negative. The chemical and bacteriological findings in the cervix were normal. Transuterine insufflation of gas easily demonstrated the patency of the tubes.

Two separate examinations done post coitum showed no spermatozoa in either vaginal vault or cervix. A condom-specimen, however, was

satisfactory according to the most critical standards, on the grounds of number, motility, and morphology of the spermatozoa.

The conclusion was that in this case the sterility was due to a combination of mechanical conditions preventing natural insemination of the cervix, and that to correct all of these would be a difficult undertaking. Inasmuch as both husband and wife were otherwise normal, it was felt that the case was a suitable one for artificial insemination. Accordingly this was carried out in the manner above described, and after the third insemination pregnancy occurred.

CONCLUSIONS

Artificial insemination is not a cure-all in sterility. Used indiscriminately and without careful selection of cases it is certain to be disappointing. In a limited number of cases presenting indications of a definite sort it is a logical method of treatment, and sometimes the most hopeful method. So used it has a proper place in the therapeutics of sterility. Neither this, however, nor any other item of treatment is likely to give good results in sterility without a far more careful preliminary study of cases than is now generally made.

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MERALGIA PARESTHETICA*

BY HENRY R. VIETS, M. D.,

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THIS rare disease was first reported by Roth and Bernhardt independently in 1895. Roth gave the disease its name, his monograph being entitled "Meralgia Paresthetica." Musser and Sailer collected reports of 100 cases in 1900 and Goldstein states that about 135 cases appear in the literature up to 1920. Osler gives a good brief description of the disease. (Principles and Practice of Medicine, 1920, P. 1055.)

The disease is usually limited to the external cutaneous nerve, which passes under the psoas muscle and appears near the surface of the body just below Poupart's ligament, passing beneath this structure at a point where the ligament is attached to the anterior superior spine of the ilium. Pressure at this point often causes pain.

About 75% of the cases are reported in men. Some are attributed to direct traumatism, or pressure from orthopaedic belts or corsets. Pregnancy is a common cause in women. The sensory disturbance consists of paresthesia over the outer surface of the thigh with slight, if any, changes in objective sensibility The anterior cural nerve may be involved as in Osler's three cases of mono-cural paresthesia. Symptoms may last for years, giving rise to only slight discomfort, but occasionally the paresthesia is persistently annoying and incapacitating.

The disease is often aggravated by standing or walking, although some cases have failed to be benefited by rest in bed. The symptoms are bilateral in 20% of the cases. Ten of Musser and Sailer's series were physicians. The sensation is usually described as "tingling," "tenseness and tearing," "formication" or occasionally a sharp, shooting pain. In Bramwell's case no improvement followed rest and faradism. The nerve was excised at Poupart's ligament. It appeared normal, both grossly and microscopically. Pain, however, disappeared at once. Other cases have shown evidence of neuritis at the point where the nerve crosses the ilium. The condition should be distinguished from the pain of cord disease, such as tabes or tumor, or from intermittent claudication due to vascular disease.

Case No. 1

A Hebrew woodturner, age 44, first had a feeling of coldness and pain on the outer aspect of his thighs two years ago. No pain was experienced in summer. Each fall with the coming of cold weather, pain began daily about 10 a. m., two hours after beginning work. He stands at his work, often moving about from bench to bench. When he rests at noon, sitting down, the pain disappears and he never has it at home in the evening. He has worked 28 years at the same job, but had no symptoms until the winter of 1921-1922. In a warm room the paresthesia is less annoying. He describes the sensation as "pins and needles," "formication," "coldness and burning." He has continued his work, but often has to rest for a few minutes after an hour of labor.

Many forms of drug treatment, rest in bed and electricity have been unavailing in removing his disability. His family and past history do not help in the diagnosis. He has had no illness, except appendicitis, 8 years ago. His habits are excellent. Arch supports and a sacro-iliac brace have not helped him. X-rays of the lumbar spines and sacral region are negative. Physical examination is negative, except for slight diminution of sensation over the area supplied by both external cutaneous nerves, and tender-

*Presented at the Boston Society of Psychiatry and Neurology, May 13, 1924.

ness just below and to the inner side of the anterior superior spines.

Operation or alcohol injection has been advised, but the patient feels that he prefers to wait until next winter, as he is reasonably sure to be free from pain this summer.

Case No. 2

A woman of thirty first noticed paresthesia on the outer aspects of her left thigh, two years ago, about the eighth month of her first pregnancy. The pain came on insidiously and reached a maximum about a month before term and continued four or five months after a normal delivery, gradually disappearing, except for a slight hyperesthesia over the skin area supplied by the external cutaneous nerve.

She now enters the hospital eight months pregnant with a history of similar pain lasting one month. She describes it as "bee stinging" and occasionally knife-like. Sleep is much disturbed and the question of early termination of the pregnancy has been seriously considered.

Examination is negative, except for the local condition. The outer, upper two thirds of the left thigh, extending on the anterior surface well towards the mid-line, is very hypersensitive. A light touch or the pressure of clothes causes great discomfort. The area does not appear anesthetic. Deep pressure just at the inner border of the anterior superior spine causes exquisite pain at the point of pressure, slightly referred to the thigh.

Alcohol was injected into the nerve by Dr. C. A. Porter the day after entrance to the Massachusetts General Hospital. Relief of the paresthesia was experienced, almost at once. Within five minutes the skin area could be handled without discomfort to the patient. Some hypesthesia developed in this area.

The patient left the hospital the next day entirely relieved of symptoms.*

*The patient passed through a normal delivery about one month later. Some slight discomfort returned in her left thigh a few days before delivery and still continued a week later. There was no severe pain or paresthesia. The patient was advised to have the nerve removed if the symptoms continued.

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FRACTURE OF RIBS BY MUSCULAR ACTION

BY FRANCIS W. PALFREY, M. D., BOSTON, MASS.

THE subject of fracture of ribs from causes other than external trauma, as discussed by Kleiner[1] in his recent article in the JOURNAL seems to warrant a report of the following experience, even though it can be given only from memory without exact details.

During the winter of 1916-17 in the British base area in Northern France, tracheitis was practically universal. Many patients also had laryngeal involvement with partial aphonia and in some the inflammation extended downward to produce bronchitis, but in most instances the presenting complaint was a violent strangling cough produced by irritation of the trachea. At 22 General Hospital, manned by the Harvard Unit, almost everyone, both patients and personnel, had this cough in some degree, and in a considerable number its effects were extremely severe.

During the author's service with this hospital he saw not less than ten cases presenting very uniformly the following picture. During a hard fit of coughing there had been a sudden stab of pain in the lower axilla or further back at the same level. Breathing at once became extremely painful so that the patient had to limit respiration as much as possible, and any cough was excruciating.

On examination in most instances the only objective findings were marked, sharply localized tenderness over a certain rib, and a little swelling. Three cases, however, are remembered in which there was distinct bony crepitus and abnormal mobility after the same history of onset. In one of these immobilization could not be secured, so that he was transferred from the hospital with the fragments still freely moveable over each other.

All of these cases were closely similar and were interpreted as fractures of ribs, complete or incomplete, from muscular action. One instance occurred in a nurse of the Unit, coming on in consequence of a sudden cough while she was laughing. One case occurred in a medical officer now returned to practice near Boston. The remainder were in patients of the hospital.

So far as is remembered, all instances involved lower ribs, such as the seventh or eighth in the mid-axillary line, and the lesions were located either in the axilla or in the region below the angle of the scapula. No preference for either side of the chest was noticed.

In over twenty years of experience with civil hospitals, the same condition has been seen not more than five, and perhaps not more than three times. At least two of these instances were in advanced pulmonary tuberculosis. In a service with the U. S. Army which included many times

the number of patients seen while serving with the Harvard Unit, the condition appeared only once. Its prevalence at 22 General Hospital is undoubtedly attributable to the widespread occurrence of severe tracheitis, as the result of which a very large number of persons were attacked by a cough of peculiar violence.

REFERENCE
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311 Beacon St.

MEDICAL PROGRESS

PROGRESS IN PSYCHIATRY

BY ISADOR H. CORIAT, M. D., BOSTON, MASS.

INTERPRETATIVE PSYCHIATRY

THE formal and older descriptive psychiatry inaugurated by Kraepelin and which was elaborated in minute detail through eight editions of his text book, the last edition extending into four volumes, is now rapidly drawing to a close. It is gradually being replaced by the newer interpretative psychiatry (Bleuler) which utilizes the psychoanalytical principles developed and elaborated by Freud and his followers. We are no longer interested as formerly in a mere cataloguing and enumeration of the symptomatology of the psychoses, but rather in the underlying unconscious mechanism of symptoms and the behavior and utterances of psychotic patients. Such investigations, utilizing the psychoanalytic approach, have exerted a great influence on the development of psychiatry, both in its theoretical and clinical aspects. It is of course, to the great merit of Kraepelin, that he has given an exhaustive description of the symptoms of the psychoses and by so doing, he has definitely formulated the prognostic aspect, leading on the one hand to the concepts of schizophrenia and manic-depressive insanity and on the other, through many changes, to a general scheme of classification of clinical types, which seems to have stood the test of practical experience to a far greater degree than other efforts in this direction.

The profession is indebted to Dr. A. A. Brill in making available an English translation of Bleuler's well known book on psychiatry, which is the outgrowth of his twenty-five years' experience as teacher and investigator in Zurich. The publication in English of Bleuler's text book is an event of great importance in psychiatric progress. Two of Bleuler's monographic studies had already been available in English for some time such as "The Theory of Schizophrenic Negativism" (1912) and "Affectivity, Suggestibility and Paranoia" (1912). In addition, there is available the address on "Autistic Thinking," delivered at the opening exercises of the Phipps Psychiatric Clinic in 1913 (American Journal of Insanity Vol. LXIX No. 5—Special number). Unfortunately Bleuler's monographic work on dementia praecox (1911) has not yet been translated, but a lengthy abstract of it has been published by the late Dr. August Hoch (Review of Neurology and Psychiatry X. 6, June, 1912). Others of Bleuler's important contributions are "Autistic Thinking in Medicine" (1919) and his constructive criticism of Freud's theories (1910).

As illustrating the evolution and development of Bleuler's approach to psychiatry, a short summary of his views as elaborated in his various publications, may not be out of place, as a preliminary orientation for a discussion of the more mature approach in his text book. In his discussion of schizophrenic negativism, he points out that most theories which had been heretofore advanced were incorrect or unsatisfactory, for negativism is a complicated symptom with many cooperating causes and not a unitary one. According to Bleuler, the predisposing causes of negativistic phenomena may be divided into four groups, viz:—

1. Ambitendency, which sets free with every tendency a counter tendency.

2. Ambivalency, which gives the same idea two contrary feeling tones and invests the same thought simultaneously with both a positive and a negative character.

3. The schizophrenic splitting of the psyche.

4. The lack of clearness and imperfect logic of the schizophrenic thoughts in general, which makes a theoretical and practical adaptation to reality difficult or impossible.

Negativism, as a psychic phenomenon, is governed by ideas and not by anatomical conditions. He further states (and this is of great importance as a psychoanalytic interpretation)—"That the negativistic repelling, very often bears the outspoken stamp of the erotic, must be due to a root of the negativism being in the sexuality xxx. We know that there is no case of schizophrenia in whose complexes sexuality does not play a prominent role, and very often the repelling is founded on sexual delusions, the patients believing themselves loved or violated.

In the volume on "Affectivity, Suggestibility and Paranoia," the discussion is very compli-

cated and only a mere outline can be given within the limited space at disposal. Briefly it is pointed out that affectivity is the dynamic force which determines our acts and shows a certain independence of intellectual processes in that the affects can be transferred from one process to another. In pathological conditions (organic psychoses, alcoholism, epilepsy, dementia praecox) abnormalities of the affectivity may dominate entire clinical pictures. Suggestibility is one side of affectivity. As for paranoia its underlying process is unknown, neither is it clear if it represents a disease entity, nor can it be definitely proven that paranoia is derived from a pathological affect.

Autistic thinking is defined as turning away from reality, seeing life in fantastic thinking. Autistic thinking is not bound by the laws of logic and reality, it is illogical and permits the greatest contradictions with the outer world and in itself. Autistic thinking is not only at the basis of insane delusions, the insane person *living* his fairy tale, but is also found in healthy persons, although in the latter instance it is always balanced by logical and realistic thinking. Autistic thinking gains the upper hand in children, under strong emotions, in dreams and in schizophrenia. This conception seems to be synonymous with what Bleuler later termed "dereistic thinking"—(away from reality). This autistic thinking has also influenced medicine in both theory and practise, in that sterile formulae are held rather than an understanding of facts.

In the monograph on schizophrenia Bleuler widens the Kraepelinian conception of the disease, including all paranoiac states, psychoses which arise on the basis of psychopathic inferiority, cases allied to the manic-depressive group, transitory hallucinatory and paranoiac states, acute alcoholic hallucinoses, the prison psychoses and abnormalities of make up (latent schizophrenia). All the symptoms are explained largely on psychoanalytic principles, (Freudian mechanisms) such as the delusions and hallucinations, the negativistic phenomena, automatisms, blockings or obstructions of thought and behavior, autism, stupor, etc.

Most interesting is Bleuler's constructive criticism on psychoanalysis. According to him, most of the attacks on Freud's teachings are based upon ignorance of his ideas, particularly of the practical application of the psychology of the unconscious. These attacks against the methods of analytical therapy are based on a misconception of Freud's ideas of sexuality, which are unscientifically combatted by the opponents from ethical motives. However, in hundreds of schizophrenic patients analyzed by Bleuler, none was without a sexual complex and, in most cases, it was a dominating symptom. Contrary to the incorrect inferences of critics, the analyst was careful not to make any suggestions leading to these sexual disclosures. If the Freudian conception of the sexual were understood, in the sense of a libido embracing all positive strivings, many of the objections to the sexual theory would be overcome.

The fundamental position of the Freudian teachings is based in logical fashion on certain facts and much of what is astonishing, is not new, but merely used in a new connection. The conclusions formulated by Freud, particularly those relating to the sublimation and repression of the sexual instinct, had long been apparent to Bleuler as a result of his psychiatric investigations. It is true that many Freudian postulates may be disputable hypotheses open to a certain amount of modification, but from which, in the future, much truth may be gleaned. Psychoanalytic therapy is still in its infancy, but psychoanalysis cures cases which are inaccessible to all other methods. It has been claimed that the psychoanalyzed persons lose their purity of mind, but Bleuler answers this erroneous view point, by stating "Is it better to relegate one's repressed sexuality to the realm of dreams or neuroses or to regulate one's acts in the light of knowledge?" Experience has proven to Bleuler that these Freudian theories which first seemed absurd, were in the end correct, if investigated further.

In the text book of psychiatry, the gradual evolution and incubation of Bleuler's ideas and experience reach their mature, focal point and for the first time, within the compass of a text book, there is presented a discussion of the newer interpretative psychiatry. The Kraepelinian classification is used, but unlike Kraepelin, there is no mere heterogenous description of symptoms, stress being laid on the meaning of symptoms, the content of the psychoses themselves and an analysis of the underlying causes of psychotic utterances and behavior. For certain psychoses this had been already done from the analytic standpoint, such as Jung's "Psychology of Dementia Praecox" and Freud's contributions to the paranoia problem.

In the text book, the analytic approach to psychiatry is utilized and that this approach has been most fruitful of results, is evident from Bleuler's statement concerning psychoanalysis. "Freud has produced a great many fundamentals which have already given the science (psycho-pathology) an entirely different structure. . . . Without them psychopathology could not have progressed." That Bleuler is pre-eminently fitted for such a task and that his analytic approach is one which should be viewed with the greatest respect, is evident from his many scientific contributions, 111 in all, according to the bibliography published in the Zeit. f. d. ges. Neurologie u Psychiatrie (1923). These contributions fall into distinct groups, viz.:—

1. Organic brain diseases
2. Criminal Psychology
3. Alcoholism
4. General Psychopathology
5. Psychoanalysis.
6. Schizophrenia
7. Mental Hospitals
8. Heredity in Mental Diseases
9. General Psychiatry
10. Medico-historical problems

The future of this interpretative psychiatry is difficult to forecast. However, since the exhaustive descriptive psychiatry has furnished fairly definite prognostic data, particularly in the delineation of certain psychoses and the effect on these of the personality traits of the affected individual, so the interpretative psychiatry is providing an insight into the meaning of psychotic symptoms and thus furnishing a valuable therapeutic approach. Already the analysts have successfully treated the border line conditions and the time may not be far distant when early latent schizophrenia, mild manic-depressive reactions, certain paranoid misinterpretations of actual occurrences may yield in a larger percentage than they do at present to the psychoanalytic method. For psychoanalysis not only gives one insight into the unconscious setting of the symptoms, but the analysis itself is a potent therapeutic agent.

THE EFFECT OF PROLONGED SLEEPLESSNESS ON MAN

In this study on the physiology of sleep, Kleitman (American Journal of Physiology Vol. 66, No. 8, Sept., 1923.) draws the following conclusions:

1. Experiments were performed to study the effects of experimental insomnia in man, the duration of complete sleeplessness being from 40 to 115 hours.

2. Subjectively the persons employed could easily keep awake while engaged in some sort of activity, but felt very drowsy when sitting and fell asleep immediately on lying down.

3. Muscular relaxation induces sleep under normal conditions (confirming Coriat), but practically precipitates sleep under conditions of experimental insomnia.

4. Blood sugar, alkaline reserve of the blood and plasma, percentage of hemoglobin, percentage of corpuscles, red and white blood cell count, body weight, basal metabolic rate, appetite, temperature, ability to name letters and to do mental arithmetic, all of these showed no variation from normal during the period of sleeplessness.

5. Respiration, heart rate, blood pressure showed a marked decrease in insomnia but this decrease was mainly due to greater muscular relaxation of the sleepy subject.

6. Numerous reflexes were found to be present in sleep following insomnia, but the response was somewhat sluggish. Sleep seemed to be deeper six hours after its onset than at the end of two hours.

7. A positive Babinski reflex could be elicited in every subject tested during the sleep that followed insomnia. It is interpreted as indicating a functional block of the pyramidal system of fibres.

8. This reflex could be reversed by rapidly repeated stimulation of the sole. The depth of sleep decreased at the same time. This indicates that a number of subminimal stimuli overcome the synaptic resistance and produce a flexion of the great toe.

9. There is a greater excretion of phosphates and acids at night: but on reversed routine, with the subjects sleeping in the day time, this condition is reversed, indicating that the increased excretion is due to sleep (confirming Campbell and Webster).

10. There is a greater excretion of chlorides in the day time: the same is true in insomnia but there is a tendency to reversal in the subject that sleeps during the day.

11. The excretion of total nitrogen and of creatinine shows little diurnal variation and is unaffected by either insomnia or reversed routine.

12. There is some evidence that diurnal temperature variation is due to the alternation of sleep and wakefulness, and the temperature wave tends to be effaced during prolonged insomnia.

13. The onset of sleep is probably due to complete muscular relaxation, voluntary or involuntary.

14. A provisional theory is proposed based on the conception of "levels" in the central nervous system, as first elaborated by Hughlings Jackson. Sleep may be due to fatigue of the highest centers of consciousness, and dreaming to the persistence of the activity of the lower centers.

FOCAL INFECTION AND MENTAL DISEASE

The extensive investigation of the subject, undertaken by Kopeloff and Kirby (American Journal of Psychiatry Vol. III No. 2 Oct. 19, 1923), is of great importance.

Focal infection has become of late a subject of special interest for psychiatry. In point of fact, focal infection has been considered to be causally related to the functional psychoses and consequently its elimination has been claimed to result in a striking increase in the number of recoveries in this group. It therefore appeared desirable to incorporate a special investigation of this problem as a part of a more general plan of intensive study of the causes, symptoms, and methods of treatment of mental disease. This study was undertaken with no preconceived hy-

pothesis: the object being simply to ascertain facts which might in any way contribute to a better understanding of the relation of focal infection to mental disease and which might be utilized to advantage in prevention and treatment. The results may be summarized as follows:—

1. In a series of 120 cases showing manic-depressive, dementia praecox, psycho-neurotic, and psychopathic reactions, the removal of focal infection in 58 cases did not result in a higher percentage of improvement or recoveries than in a comparable group of 62 cases in which foci of infection were not removed.

2. Reviewing the entire group of operated cases showing recovery or improvement, and comparing the original prognosis with the subsequent course, our observations demonstrate that in every case that recovered, a recovery had been forecast before treatment was started: that no case recovered in which a poor prognosis had been given. Furthermore, in only one case did an unexpected improvement occur.

3. A critical study of the methods used by Cotton for establishing focal infection has proven them to be unsatisfactory for teeth, stomach, lower intestine, and cervix.

4. It is desirable to eliminate focal infection when adequately demonstrated in psychotic patients in the same way as one should attempt to alleviate any physical disorder in mentally diseased patients. Nevertheless, it has not been shown that focal infection is the etiological factor in the functional psychoses.

ARCHAIC THINKING IN SCHIZOPHRENIA

In a volume entitled "The Primitive Archaic Forms of Inner Experiences and Thought in Schizophrenia" (Translated by Clara Willard for the Nervous and Mental Monograph Series —1924) Dr. Alfred Storch has contributed an illuminating and profound genetic and clinical study of Schizophrenia. It attempts, by means of analysis, to discover a deeper foundation for the disease picture of dementia praecox as first described by Kraepelin, the special problem being an examination between the experiences and thinking of schizophrenics on one hand and these same processes in archaic form in primitive races on the other. The problem arose from the general recognition of the connection between dreams and the primitive mental life and between dreams and mental disorders, for long before the advent of psychoanalysis, there was noticed the relationship of functional disturbances of thought and the earlier psychic stages in evolutional development. Nietzsche had long ago recognized the close connection between the dreams and primitive ways of thinking and later psychoanalytic investigation emphasized this relationship. (Freud, Jung and Bleuler.) In dreams there is a close analogy to schizophrenic thinking and in his "Psychology of Dementia Praecox" Jung stated, "Let the dreamer walk about and act like one awakened and we have the clinical picture of dementia praecox. Dementia praecox only sets in motion a performed mechanism which normally regularly functionates in dreams."

This monograph discusses in turn the archaic primitive motivation of thought and of motor tendencies in schizophrenia, the schizophrenic consciousness of self and of the objective world and the magic-taboo attitude and magic primitive transformations of the personality in schizophrenia. As a result of this extensive and scholarly investigation, the author, in summary concludes as follows:—

"In everyone the magic-archaic experiences are present as the (unconscious) undercurrent of the waking thoughts of the day, but only in specifically schizophrenic types does this undercurrent come to active conflict with the ordinary thoughts of the understanding."

SCHIZOPHRENIA

This contribution by Professor Karl Wilmanns of Heidelberg (Zeit. f. d. Gesamte Neurologie u. Psychiatrie Vol. 78, 1922) is an exhaustive and at the same time an impartial review of the present knowledge of the subject and the medical profession is indebted to Dr. James V. May for the translation into English. (Bull. of the Mass. Dept. of Mental Diseases VIII 2-3 Aug., 1923.) As the article is very long, only a few of the essential points can be presented in abstract and the reader who is sufficiently interested can turn with profit to Dr. May's translation.

In any review of the development of schizophrenia (dementia praecox), it can be shown that the history of schizophrenia is the history of psychiatry during the last thirty years. The older conceptions of hebephrenia (Hecker) and Katatonia (Kahlbaum) were rejected at first even by Kraepelin, the theory and conception of dementia praecox not being recognized by Kraepelin until the appearance of the fourth and the fifth edition of his text book (1893 and 1896), where the disease was classified as a deteriorating process under the caption of disorders of metabolism. The conception was further elaborated on clinical foundations, until the paranoid forms were included as a special deteriorating process under the name of paraphrenia. It is impossible within the limits of this review to give any further details of Wilmanns' admirable summary of the development of the Kraepelinian conception of dementia praecox, other than to state that Wilmanns considered the disease as an entity, in spite of the manifold symptomatology.

There is then discussed Bleuler's conceptions

of schizophrenia. Bleuler has widened the original conception, he interprets all diseases which present the fundamental disease picture considered characteristic of schizophrenia, as schizophrenia, while according to Birnbaum, all alcoholic paranoia should be classified as schizophrenia precipitated by alcohol. According to Bleuler too, the basic symptoms of schizophrenia show all transitions to normal mental processes and extend into the non psychotic mental life. Kraepelin produced a description of schizophrenia, while Bleuler, basing his conceptions upon psychoanalysis, produced a psychology of the disease and through psychoanalytic conceptions, has been able to explain the real motives for such important schizophrenic symptoms as ambivalence, stupor and negativism. Concerning this psychoanalytic approach to the schizophrenia problem, Wilmanns goes on to state:—"Those who are not followers of Freud will not deny the tremendous influence which he has exercised in our psychiatric thought. If we now endeavor to delve much deeper into the mental life of our patients, its content presents an entirely different significance, then Freud has materially contributed to this development." While admitting the value of the psychoanalytic interpretation of schizophrenia, yet at the same time Wilmanns feels that this approach has been only partially successful in elucidating the symptomatology of the disease.

He then goes on to summarize the various other approaches to the problem (Jaspers, Kretschmer, Kahn, Birnbaum) including the so-called situation or prison psychoses and then passes to a review of the hereditary factors in the disease (Rudin). He points out that psychiatric researches in heredity cannot be limited to laying the foundation for statistics within the families of obvious psychoses, but must keep in view the inconspicuous prevalent disturbances appearing as abnormalities of character (schizoid and cycloid). However this is an extremely difficult task. Kretschmer has attempted to correlate the physical characteristics to the mental constitution of the patients which he divides into various types.

After a discusison of the histo-pathology of dementia praecox and the Abderhalden reactions, the latter having been rather fruitless in its results, the paper closes with the statement that we are still at the beginning of our knowledge of the subject and only a combination of the various methods of approach (psychoanalytic, pathological, heredity studies, chemical) can satisfactorily solve the problem.

BOOK REVIEWS

The Child: His Nature and His Needs. The Children's Foundation. Valparaiso, Indiana, 1924.

This volume is the first important contribution from the Children's Foundation, an endowed organization founded in 1921. It reviews and interprets present day knowledge pertaining to child nature and to the well-being and education of children. Such a broad field could only be covered by many writers. Each chapter is written by a specialist. The three divisions on Child Nature, Child Well-Being, and Child Education, are sub-divided into many sections, the whole comprising a bulky volume of over 500 pages, profusely illustrated. The chapters on Child Well-Being are of most interest to physicians. Two notable articles are written by Dr. William R. P. Emerson on the "Relation to Nutrition and Mental Development," and by Dr. William Healy on the "Treatment and Prevention of Delinquency." Much emphasis is laid on mental hygiene, a long neglected factor in the training and education of children, in fact the whole book is a treatise on the mental development of the child as affected by his inheritance, environment, and training. It is a broad-minded point of view, one not possible a generation ago. As such the book may be considered as a pioneer effort to correlate the views expressed by the attorney, psychiatrist, and educator. It seems to the reviewer worthy of the fine standard set by the Children's Foundation. Copies may be had for $1.00 by addressing the Children's Foundation, Valparaiso, Indiana.

Tuberculosis. A Primer and Philosophy. By McDugald McLean, M. D. Published by Journal of Outdoor Life, New York.

This second edition of Dr. McLean's book shows its value more than anything else. Dr. McLean, who died in 1922, writes from long personal experience with tuberculosis which is interesting and somewhat unusual.

His chapter on "Danger Signals" is important and valuable as is likewise that on "Good and Bad Advice" and on "Morale." In his chapter on "Helpful Suggestions" which is devoted chiefly to diet and food one finds various statements with which it is impossible to agree. In his lists of foods, for instance, containing proteins, *carbohydrates* and fats he makes no mention of potatoes, rice and macaroni. He likewise recommends malted milk, egg flip, to be taken once a day or every other day. I believe that the vast majority of tuberculosis patients would be greatly benefited if such preparations were entirely eliminated from their diet. He likewise is an enthusiast in regard to *Ovaltine* with which I am not familiar.

His chapters on "Physician and Patient," "The Fear of Tuberculosis and the Careless Consumptive," "Patent Medicines, Charlatans and Christian Science," etc., are excellent.

The book contains much that is interesting and helpful. J. B. H.

Case Records
of the
Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY
RICHARD C. CABOT, M.D., AND HUGH CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 10371

An Irish housemaid of thirty was sent from the Emergency Ward May 4, delirious. The history was obtained from the physician in whose home she had worked for eleven years.

F. H. and P. H. not recorded.

P. I. Ten days before admission, when in her usual good health, she went to a wedding, ate lobster and other unusual foods, and probably drank one glass of home-brewed liquor. After this she had general indisposition, attributed to "ptomain poisoning." She had constipation, for which she took considerable cascara and a dose of salts. A mild diarrhea followed. Then she began to run a low temperature. The doctor suspected typhoid and awaited developments. Four days before admission she took a turn for the worse. There was no increase in temperature and pulse. For several days before admission she had mild delirium, but refused to stay in bed, as she had since the onset. The respirations were increased and the physician found râles in both chests. The day of admission she was up and about. At no time during the illness did she complain of pleural pain, cough or sputum. Upon entrance to the hospital she said she did not feel ill and thought she was gradually getting better. She entered the Emergency Ward definitely toxic, with high respiratory and pulse rate.

P. E. Fairly well developed, rather poorly nourished. Skin moist. Eyes had a staring wide-awake appearance. Fingers and mucous membranes deeply cyanotic. Apex impulse of the *heart* in the fifth space. (No measurements recorded.) No enlargement to percussion. Very rapid. Impossible to determine murmurs accurately; none made out. Full pulse at wrist. B. P. not recorded. *Lungs* hyperresonant throughout both chests. No definite dullness, though the hyperresonance had a note of dull tympany. Breath sounds harsh, probably because of the labored breathing. Numerous loud crackles which sounded close to the ear in both axillae and back. A few in front. *Abdomen.* She had evidently breathed with the diaphragm only. Both upper quadrants rigid. Liver and spleen could not be felt, but satisfactory examination was impossible. *Pupils* reacted very sluggishly. *Reflexes.* Knee-jerks normal. Neck held slightly rigid. She complained of pain on extreme flexion, though it was noted that she moved the neck spontaneously through small ares when questioned. No Kernig. *Pelvic* and *rectal examinations* not recorded.

T. 104.7°-104°. *P.* 142-141. *R.* 68-30. *Urine* not recorded. *Blood.* Hgb. 75%, leucocytes 12,200. Smear unusual; apparently far greater leucocytosis than 12,200; polynuclears 89%, and of these several were early metamyelocytic forms. Platelets diminished. Reds normal. *Wassermann* not recorded.

On examination at midnight, six hours after entrance, the pulse was 160. The cyanosis was striking, especially over the extremities. The lips were dry. The fundi were negative. On passive flexion of the head she complained of some pain, but the neck was not stiff. Actively she moved the head about and flexed the neck fairly well without apparent pain. There was questionable relative dullness in the left upper chest anteriorly, also slight dullness posteriorly in both bases, especially the left. Showers of very fine crackles were heard in the left axilla, also a few in the right. There was very little if any movement of the thorax. On turning the patient on her side for examination of the back she coughed several times, a dry unproductive cough. The breath sounds were not especially remarkable; perhaps somewhat depressed in the bases of the right axilla and the right upper chest anteriorly. There was no bronchial breathing. The lower abdomen was soft. The extremities were negative.

At four o'clock the morning of May 5 she died.

DISCUSSION

BY DR. RICHARD C. CABOT

NOTES ON THE HISTORY

I have often expressed my sentiments on the subject of "ptomain poisoning," and pointed out how uncommon it is, how often it turns out to be appendicitis, peritonitis,—all sorts of things. "Ptomain" sounds well. The laity like to hear it. It gets the doctor out of many a hole. But I never saw any clinician who knew what he meant when he said it. Food poisoning is a real thing, but most of the "ptomain" cases are not real. Of course there is the tremendous group of botulin poisoning, which is very definite poisoning. But they do not call this ptomain.

She had not a subnormal but a low temperature.

They are thinking of pneumonia or miliary tuberculosis, but especially pneumonia.

"Definitely toxic" means probably the nervous symptoms.

So far I have no idea what she has. Pneumonia certainly cannot be ruled out.

NOTES ON THE PHYSICAL EXAMINATION

"Poorly nourished" is important. "Deeply cyanotic" is important. We have had nothing yet to suggest why that should be.

Of course there were no murmurs.

There were no crackles at the apices.

The neck is slightly rigid. That is important; if it were more than slightly rigid we should think more of it.

This is about as rapid respiration as we ever get.

This blood report does not mean anything in particular.

I am still in the dark, but I have some guesses. We must consider the striking cyanosis, because we have not much to show for it. There is one disease that gives striking cyanosis under these conditions, and that is in my mind.

I do not know why there was no movement in the thorax. None of the ideas in my mind would account for that.

She has not coughed when turned on her side until the latter part of her illness apparently.

This is a well made examination. They are committing themselves on everything.

DIFFERENTIAL DIAGNOSIS

Let us start with the abdomen. We have a couple of rigid upper quadrants with high fever and considerable leucocytosis. Can this be a general peritonitis? I do not believe it. She has had no pain, and although we can have general peritonitis with non-characteristic physical signs, we get a characteristic history in every case except the post-operatve cases. So I do not believe this is general peritonitis, or that the rigidity of the recti was important.

Can she have had a general septicemia, which kills people in something this way,—streptococcus septicemia, we will say? I cannot rule it out. I do not see how anybody can say she has not got it. We did not get a blood culture. She had no hemorrhages under the skin, no chills, no point at which the organism can be supposed to have gone in. But it may come from a hangnail. I knew a man who on a Sunday had a little hangnail and on Thursday was dead with streptococcus septicemia, proved to be such, with pus in every joint. So we need only a very small localizing focus. But we have no localizing focus here.

It looks like a chest case. I do not see how else we are to account for so much cyanosis. Is it in the heart? I do not believe it. We have very slight heart sounds and no evidence of passive congestion. Then it is a lung case. What can it be in the lungs? It can be two things, pneumonia or miliary tuberculosis. My diagnosis is between those two, and I can think of no third.

PHYSICIANS: Bronchitis? Laryngeal diphtheria?

DR. CABOT: I do not think so. She has had no difficulty in respiration, no stridor or affections of the voice such as we get if it is down in the larynx. They looked in her throat and saw nothing. I do not believe it is diphtheria.

A PHYSICIAN: Subdiaphragmatic abscess?

DR. CABOT: Subdiaphragmatic abscess would account for the symptoms in the abdomen, but not for the cyanosis; and I never knew it to kill anybody so quickly. More often it comes after a history of perforated gastric ulcer or perforated gall-bladder.

A PHYSICIAN: If this is pneumonia how do you account for the relatively low leucocytosis?

DR. CABOT: That is one of the easiest things. I have often seen this picture. What we say is "overwhelming infection." It is a very convenient phrase. I do not have any difficulty with the blood. I have great difficulty with so much cyanosis and so little in the way of physical signs.

A PHYSICIAN: Pneumothorax?

DR. CABOT: That is a diagnosis which nobody can make on these signs. I do not believe it.

Is the nervous system involved? No, I think not. I do not think the brain will show anything unless it is part in a general miliary tuberculosis. The delirium I think is part of the infection. Typhoid fever, pneumonia, anything will give such a delirium.

A PHYSICIAN: Could she get stiff neck from mediastinal glands?

DR. CABOT: She could get as much as this, which is very little, from any infection. We often see it in pneumonia.

I cannot make any diagnosis except miliary tuberculosis. But it is a poor diagnosis, because we have so little to support it.

A PHYSICIAN: Pneumococcus meningitis ought to give us more meningeal symptoms.

DR. CABOT: I never saw it with no Kernig and no stiff neck. They did not tap the spinal cord,—I do not know why not.

So although I think my diagnosis is probably wrong I can reason out no other. I am not at all sure that it is not pneumonia, but I think it is more like miliary tuberculosis.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Pulmonary tuberculosis.
Miliary tuberculosis?
Sepsis.

DR. RICHARD C. CABOT'S DIAGNOSIS

Miliary tuberculosis.

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesions*

Septicemia, pneumococcus.
Acute meningitis, pneumococcus.

2. *Secondary or terminal lesions*

Acute pleuritis.

Chronic and acute endocarditis of the mitral valve, stenosis.
Slight hypertrophy and dilatation of the heart.
Slight chronic passive congestion.
Soft hyperplastic spleen.
Nephrolithiasis, left kidney.
Slight hydronephrosis, left.

3. *Historical landmarks*

Slight chronic pleuritis, left.
Obsolete tuberculosis of the mesenteric glands.

DR. RICHARDSON: The pia along the vessels of the convexities out and along the vessels of Sylvius was coated with exudate,—pneumococcus.

The mesenteric glands in instances were enlarged and showed some fibrocalcareous degeneration.

Each pleural cavity contained 150 c.c. of thin cloudy fluid and fibrin. There were a few old pleural adhesions. There was a little passive congestion of the lungs.

The heart weighed 260 grams, for her a little enlarged. The myocardium was negative. There was chronic and acute endocarditis of the mitral valve—stenosis.

There was some congestion of the liver, spleen and kidneys. In the left kidney, which was small compared with the other, the pelvis and calices showed a little dilatation. In one calix there was a small stone.

Culture from the heart blood showed a good growth of pneumococcus, pure.

DR. CABOT: There is nothing to say. The cyanosis was evidently due in part to the mitral even though there was no passive congestion. We could not have made that mitral diagnosis. Nothing with the signs we had would have enabled us to make it. Of course if we had been there we might have heard something more than they recorded.

CASE 10372

A twelve-months-old American boy was brought to the Out-Patient Department October 19.

F. H. A brother two years old was living and well.

P. H. and P. I. The patient was the second child. He was normally delivered two weeks before full term and weighed six pounds at birth. He was nursed for nine months. Artificial feeding had gone well and he had gained since he was ten months old. He was backward, did not sit up or hold his head up, could not feed himself, had no teeth, and did not talk. He was fussy and colicky at night. He noticed things, noticed his brother, and played with his hands.

P. E. An obviously idiotic child with lolling head and protruding tongue, a blank expression, and the general development of a four-months-old baby. Head narrowed in frontal region, but fairly well formed behind. Scalp veins somewhat dilated. Sutures poorly joined. Anterior fontanel 3½ cm. by 5 cm. Posterior fontanel open. Hair sparse; "cradle cap." Skin dry, with a tendency to scaling. No fat pads. Marked rotary nystagmus in both eyes. Sclerae clear. Epicanthus of both eyes and lateral commissure higher than normal. Nose, flat bridge, round nostrils. No teeth Throat and anterior pillars reddened. Short pharynx. High palate. Ears small and round. not lobulated. Flaring rib margin with some grooving. Axillary glands palpable in the left. No thymic dullness. *Lungs* normal. *Heart* not enlarged. Difficult to percuss. Sounds embryonic in character. No murmurs. P_2 greater than A_2? *Abdomen* soft, flat. Liver one finger-breadth below the costal margin. Spleen not felt. Flaccid muscles. *Genitals.* Long adherent and excoriated prepuce. Testes normal size, in scrotum. *Extremities.* Hands square, with short blunt fingers (see Plate I). Very marked hyperextemsibility of all joints and

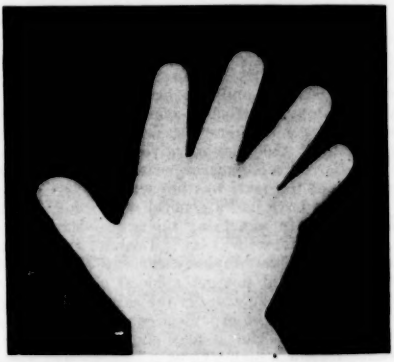


PLATE I. Hand of patient in Case 10372.

flaccidity of musculature. Deficient hip-joint capsule. *Pupils* markedly irregular. *Reflexes.* Knee-jerks normal. Superficial reflexes, abdominal and cremasteric, not elicited. The total *basal metabolism* was that of an infant of eight months. He was approximately 40% underweight and also underheight.

At the first visit a prescription was given for a quarter grain of thyroid daily.

November 23, a month later, he was very much more active. The neck seemed a little stronger. The tongue was the same. The order was changed to half a grain of thyroid for two weeks, i. e. a quarter grain twice a day; then three-quarters of a grain—a quarter grain t.i.d.

January 29 he could hold up his head. He had fattened a great deal, and his flesh felt more solid. The back of the neck had filled out. He could hold things, shook his rattle, "got location better," and tried hard to talk. His bowels were still inclined to be constipated. The legs were as flexible as ever. He still had no teeth. He was gaining weight. He could look

PLATE II. More characteristic "trident" hand of another Mongolian idiot, showing the hooked little finger.

at people longer, and his eyes quivered less. The soles of the feet and the knees showed purpuraceous scaling. The order was to continue three-quarters of a grain of thyroid and to give two grains of anterior pituitary once a day.

April 29 (see Plate III) he had had no thyroid since the last note. He sat up better. He had five teeth. His chest had developed. For six or eight weeks he had reached for objects, played with them, and went after them when he lost them. His tongue was in most of the time, and he tried to talk. He did not take solid food. His bowels were still constipated. Examination showed that the bridge of the nose was developing. The eyes still tipped. There was marked epicanthic fold. The body was flexible. There were fat folds around the neck and small ones on the hands and feet. The muscles were hypotonic. The skin was fine except where irritated; there thick and coarse. The hands were square (see Plate I, taken at this time). Orders, three-quarters of a grain of thyroid daily and two grains of pituitary.

June 9 there was no change except that he sat more strongly and ate better. He was developing a temper. Examination showed that he had lost some of the fat pads. He was still cross-eyed at times. The fontanel was still open. His length was 73 cm., weight 17.5 kilos without clothes.

Discussion

BY DR. FRITZ B. TALBOT

This is a characteristic case of Mongolian idiocy. The importance of this case lies in the fact that this condition is frequently confused with cretinism. The two have certain features in common. The body is a little shortened, but less so in Mongolianism than in cretinism. The neck is usually plump and short in both conditions. In both there is a lowered basal metabolism, that of the cretin being much lower than that of the Mongol.

Here the similarity ends. The ossification of the bones in the wrist in the cretin is delayed, while that of the Mongol is nearly normal. The skin of the cretin has a yellowish tinge, is dry, and the top layer rather thickened, while that of the Mongol is shiny and of more normal texture. The face of the cretin is dull and yellowish, and that of the Mongol is usually red as if painted. The hair of the cretin is sparse, coarse, and brittle, while that of the Mongol is usually fine and silky. The eyelids of the cretin are thickened and seem to be edematous, while those of the Mongol are thick and sharp, with a marked epicanthic fold. The tongue of the cretin is enlarged and thick, while that of the Mongol is not so much thickened, when protruded goes out to a blunt point, and is frequently furrowed. The eyes of the Mongol slant upward, giving a characteristic Mongoloid expression, and the extremities are very flexible. The Mongol frequently has the hooked little finger. There should be no difficulty in recognizing a Mongolian idiot.

The two conditions are, however, often confused, because many Mongols suggest myxedema. A true cretin, on the other hand, never simulates a Mongolian idiot. The difficulty in making a differential diagnosis is found especially in those cases of Mongolianism in which the myxedematous element is pronounced. The child may be stupid and quiet, and may be observed in such a position that the characteristic features of the eyes are not obvious. If the physician will watch patiently the child will eventually make some grimace which will immediately make the diagnosis clear.

The results of treatment are not satisfactory. Considerable improvement, however, can be obtained by administering thyroid extract, which usually stimulates the intelligence beyond the point that it would have gone if the child had remained untreated. The Mongol will stand a surprisingly large amount of thyroid extract. I have given a six-months-old baby one and one-half grains or more per day, a two-year-old child three grains, and an eight-year-old six to eight grains a day, and have seen a year-old infant given twelve grains a day without signs of intoxication.

Improvement which could be attributed to treatment in the case under discussion was first

that he became stronger and could hold up his head. At the same time the flesh became firmer. Three months later he was reaching for objects, trying to talk, and kept his tongue inside his mouth most of the time. One of the most distressing symptoms from the parents' point of view is the protruding tongue. They are always much gratified to find after a course of treatment with thyroid extract that the tongue is no longer out.

Without thyroid treatment the physical development of these children is abnormal. Their teeth erupt in a peg shape. They are more or less handicapped because of the amount of myxedema present. Their general health is apt to be poor, for they are peculiarly susceptible to general infections. Under thyroid treatment the teeth have a normal appearance, the handicap from myxedema is removed, leaving only the fundamental defect, and the resistance to infections seems much increased.

PLATE III. Patient April 29, aged a year and a half.

Some improvement has been seen after the administration of other glands of internal secretion, but up to the present time it has not been consistent or convincing. Theoretically if marked improvement is to be obtained treatment should be instituted immediately after birth to allow the brain to develop during the first eight months, the period of most active growth. I have seen complete mental development of a cretin whose treatment was instituted at the age of eleven weeks, and failure of complete mental development in cases where treatment has been postponed too long. The longer treatment is postponed in the cretin the poorer will be the results, and it seems reasonable that the same principles will apply to Mongolianism.

Since these children are imitative they can be taught a great deal. I have seen cases which have been able to repeat the alphabet, recite poetry, and take part in simple everyday affairs. The prognosis of this condition is said to be bad for complete mental development. It must however be recognized that there are degrees of feeblemindedness, from almost complete helplessness to an intelligence which can be taught a simple trade and become self-supporting.

DIAGNOSIS

Mongolian idiocy.

CASE 10373

An unmarried Swedish waitress of forty-eight entered December 3 complaining of bitemporal hemianopsia, "nervous trouble" and "stomach trouble."

F. H. One brother had "bad nerves."

P. H. She had measles and scarlet fever in childhood, and many sore throats before tonsillectomy two years ago. She had always been somewhat "nervous." Since childhood she had had headaches of the migraine type. She now had more or less constant suboccipital headache. She had worn glasses for ten years. For the past six months she had left off her glasses, as they did not fit and the doctor thought she did not need them. She urinated five or six times by day and once at night, sometimes oftener when she was very nervous. She had urgency also when nervous. She passed the menopause at thirty years. Her best and present weight was 122 pounds.

P. I. Six years ago she began to have occasional periods of heartburn, sour eructations, discomfort in the pit of the stomach, and nausea. The pain occurred at any time of day, often in the morning, relieved by taking a little water, which would bring up gas; after this she would feel well perhaps all day. The pain seemed to have no relation to meals. Five years ago she felt she was becoming more and more easily worried and startled. Two years ago she noticed a twitching sensation in the outer corner of the left eye. A doctor advised rest. Shortly afterwards she noticed a limitation of the temporal field of vision on the left. This was soon followed by the same condition on the right. Since that time the two temporal fields had steadily

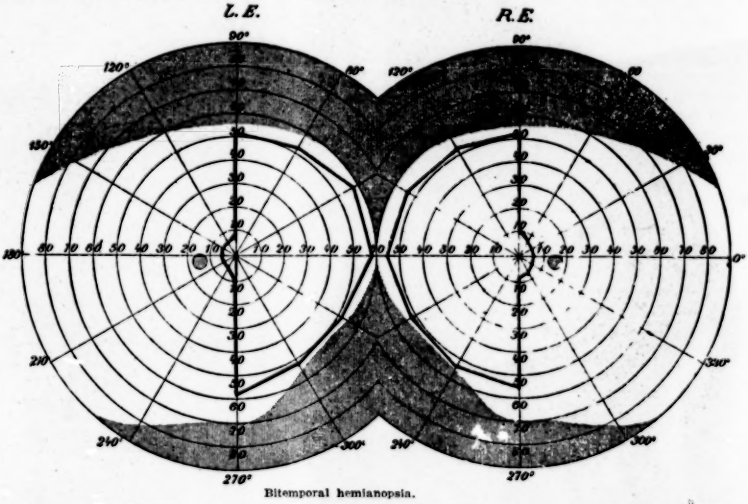
diminished. Until she took a few months' rest last summer she was troubled with more or less constant numbness and prickling sensations in the hands and arms. After the rest these disappeared. For the past six months she had had some trouble with double vision and had not been able to read because the words had looked jumbled together.

P. E. A slender, neurotic Swedish woman complaining of numerous symptoms, especially recent visual disturbances. All teeth missing. *Lungs* normal. Apex impulse of the *heart* not found. Measurements not recorded. No abnormalities noted. *B. P.* 120/70. *Abdomen.* Entire large bowel palpable and slightly tender. Marked tenderness over McBurney's point. *Pelvic examination* not done. *Rectal examination* negative. Rectum full of feces.

Before operation *T.* 97°-99°, *P.* 68-90, *R.* normal; *urine,* amount not recorded, neutral at one of two examinations, cloudy at a second, sp. gr. 1.033 at both, no albumin or sugar; *blood,* hgb. 75%, leucocytes 8,200, polynuclears 72%, reds normal. *Wassermann* negative. *Throat consulation.* All sinuses transilluminated clearly and equally. *X-ray.* Marked abnormality in the region of the sella, which was very irregular in outline and large. The dorsum was visible but very irregular, and had an eroded appearance, although it was not displaced backward. The sphenoidal space beneath the sella was apparently reduced in width by the depth of the sella. Within the sella cavity were irregular shadows, perhaps representing calcification in the gland. *Neurological examination.* Well oriented. Intelligent. No hal-

Marked abnormality in the region of the sella, which is very irregular in outline and large. The dorsum is visible but very irregular, and has an eroded appearance, although it is not displaced backward. The sphenoidal space beneath the sella is apparently reduced in width by the depth of the sella. Within the sella cavity are irregular cavities, perhaps representing calcification in the gland.

lucinations, but quite apprehensive. Cranial nerves: By crude finger test no definite narrowing of visual fields made out. Vision very good. All other cranial nerves normal. Spinal nerves normal. Reflexes, Knee-jerks, Achilles, biceps, triceps, abdominals very active but equal. Negative Babinski, Kernig, clonus and Romberg. No cranial or spinal deformity or tenderness. *Eye examination.* *Visual fields* showed bitemporal hemianopsia. *Fundi.* Discs, sharp margins. Pallor? Physiological cups shallow. No elevation of discs. Vessels normal. *Muscles.* No paralysis.



Bitemporal hemianopsia.

December 10 operation was done. The patient was sent to the ward in fair condition, made a good ether recovery, and did fairly well next day. There was some edema of the right eye. There was apparently right facial paralysis. The left corner of the mouth twitched, the attacks beginning about five o'clock December 12, occurring every fifteen minutes and lasting a minute. That day the right eye was swollen shut. The wound was clean. Two days later the twitching of the mouth was less and she was quite comfortable. Beginning December 15 she had fever and elevated pulse. No cause was found except a slight head cold. December 20 three stitches were removed, as they were slightly septic. No pus was obtained. The temperature was 106°. The convulsions were worse and were now generalized. December 21 she died.

Discussion

by dr. william jason mixter

The outstanding features in this history and physical examination are the presence of bitemporal hemianopsia coming on gradually for two years, and also the presence of marked deformity of the sella turcica by X-ray. The nervousness, abdominal symptoms, etc., are of secondary importance to the findings noted above. Such findings indicate the presence of a tumor of the hypophysis cerebri, the word tumor being taken in its widest sense. Such a mass may be a cyst, an adenoma, simply a hyperplasia of the gland, or carcinoma.

There are two types of surgery that can be performed in such a case, two very different methods of approach. The transsphenoidal approach of Cushing is especially adapted to lesions of the hypophysis in which the growth of the tumor has been downward into the sphenoidal sinuses. If the growth seems to be projecting upward an approach either from the side or from the front, lifting up the brain and exposing the interpeduncular region in this manner, is more rational, but also much more difficult and carries a far higher mortality. On account of the X-ray findings such an approach would be indicated in this case.

DIAGNOSIS OF NEUROLOGICAL CONSULTANT, DECEMBER THIRD

Pituitary tumor.

X-RAY INERPRETATION, DECEMBER FIFTH

Findings are those of probable pituitary tumor.

PRE-OPERATIVE DIAGNOSIS

Pituitary tumor.

Operation

Gas and ether. Large right temporal osteoplastic flap. Very little bulging of brain on

opening dura. Frontal lobe lifted upward and temporal lobe drawn back. Pituitary fossa exposed, and round soft tumor 2 cm. across lying between optic nerves. Tumor incised and the major portion of it removed with a scoop. Very little bleeding. Moderate shock. Wound closed in layers.

Further Discussion

Up to this point the patient's convalescence was apparently satisfactory. The edema of the eye, the facial palsy, and the twitching of the corner of the mouth are to be explained on the ground of injury to the brain at operation from pressure of retractors. I should doubt the statement that there was a right facial palsy. It is frequently difficult where the eyes are swollen to differentiate between a right and a left facial palsy. I should say it was almost certain that the house officer made either an error in observation or a clerical error in his record concerning the side of the paralysis.

During the following six days the patient's condition became rapidly worse. The record is not complete. There is no statement as to whether or not she had stiff neck and Kernig. There is also no statement as to the condition of the chest. I do not feel that we can make any definite statement as to the immediate cause of death in this case owing to the paucity of the record. It happens, however, that I remember a certain amount about this case. This patient did show during this period a moderately stiff neck and a positive Kernig at times. Lumbar puncture was discussed but not advised owing to the danger of spreading a possible localized meningitis at the field of operation. At no time did she show evidence of increase in intracranial tension. It was difficult or impossible to explain the convulsions. The chest was examined only by the house officers and was reported practically negative throughout her illness.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Pituitary tumor.
Operation, extirpation of pituitary tumor.
Contributing cause, basilar meningitis.

DR. WILLIAM JASON MIXTER'S DIAGNOSIS

Pituitary tumor.
Contributing cause of death probably septic meningitis.

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesion*
   Carcinoma of the hypophysis cerebri.
2. *Secondary or terminal lesions*
   Bronchopneumonia.
   Operation wound.
   Chronic endocarditis of the mitral valve.
   Otitis media, left.
3. *Historical landmarks*
   Slight chronic pleuritis, left.

Dr. Richardson: On the right side of the head there was a horseshoe-shaped operation wound. Beneath this there was a bone flap 7½ cm. across. On the inner surface of the bone flap there was a thin layer of blood clot. In the region of the upper part anteriorly on the temporal sphenoidal lobe the brain presented a small area of disintegration. The vessels of Willis, sinuses and right middle ear were negative. The left middle ear contained a small amount of pus, cover glass from which showed leucocytes and pneumococcus-like forms. The pineal gland was negative. In the sella turcica in the region of the pituitary gland there was a small mass of new-growth-like tissue. This rested in the hollow of the saddle, which was considerably larger than usual. There was a small amount of blood clot in the region. The brain otherwise was negative.

The skin and mucous membranes were pale.

In the right pleural cavity there was about 50 c.c. of thin cloudy fluid and fibrin. The left contained a few c.c. of similar fluid. The upper lobe of the left lung was bound down by old adhesions. The trachea and bronchi contained a moderate amount of mucopurulent material.

In the upper lobe of the right lung and in the upper part of the lower lobe there were numerous areas of bronchopneumonia. The cut ends of the bronchi in this region yielded mucopus. There were numerous areas of bronchopneumonia scattered through the lower lobe of the left lung.

In the region of the posterior cusp the mitral valve presented along the free margin an irregular band of fibrosis 4 mm. wide and 1 to 2 mm. thick. The chordae tendineae leading to it were shortened and thickened. The endocardium of the auricles close to the valve curtain presented a few small patches of fibrous roughening.

Culture from the heart blood showed no growth.

A case of carcinoma of the hypophysis with terminal bronchopneumonia, acute pleuritis and otitis media, associated with a slight amount of chronic endocarditis of the mitral valve.

CHILDREN IN THE FEDERAL COURTS

All but two States have laws providing for juvenile courts for boys and girls. All but one State have probation systems through which the delinquent child may be given a chance to make good under trained supervision. But our Federal law makes no distinction between adults and children. The youngster who defaces a mail-box, steals a ride on a train across State lines, or in some other way breaks the Federal laws must, according to the law, be dealt with on the same basis as an adult offender. A bill which would establish a probation system in United States courts has been favorably reported in the House of Representatives.—*Children's Bureau, U. S. Dept. Labor.*

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IODINE AND THE VITAMINS

VIEWS on medicine are changing continually, or perhaps, it would be more correct to say are being subjected constantly to modification. This self evident fact which, by the way, is significant of progress was well exemplified by a discussion on diet which took place at the recent meeting of the British Medical Association. In opening this dscussion Professor John Boyd Orr, director of the Rowett Research Institute, Aberdeen, pointed out that during the past few years there had been a tendency to regard the evil effects of too exclusive a use of certain refined food-stuffs as due chiefly or entirely to a deficiency of vitamins. He dissented from this one sided view and said that recent work had shown that many of the evil effects might be attributed to a lack of correspondence between the mineral content of the diet and the mineral requirements of the body—of the chemical elements making up the body two thirds were mineral and each performed functions which could not adequately be performed by any of the others. Moreover all these minerals were being continually lost from the body in the excretions, and all were required as the constructive material of growth.

Dr. Orr emphasized the point to which he has directed attention previously, that in some of the work on vitamins much of the beneficial effect ascribed to hypothetical vitamins is in reality due to the minerals present in the substances given as a source of vitamins. Thus foodstuffs, rich in inorganic constituents, which are liable to be deficient in modern diet are also rich in vitamins. While some of the elements in the body are present in ridiculously small quantities, each one exerts a profound influence upon the well being of the animal. For instance, the human body contains, in its normal thyroid gland, one-fifteenth of a grain of iodine. This minute quantity suffices for the needs of the body but a very small deficiency, relatively, may have a very serious effect upon body growth, the more so as the thyroid gland is completely bound up in the control of metabolism. There is half an ounce of manganese present in a healthy body and a deficiency means disease and so with the other elements. Consequently if one carefully plans a diet which will include all the essential elements, one finds that it will contain the hypothetical vitamins as well. There is some doubt therefore if vitamins exist as separate substances, experiments carried on during many years have failed to isolate and identify them.

Of all the elements making up the body iodine is of the first importance, a truth which is being grasped and appreciated at its worth almost daily. It is recognized that a deficiency of iodine in the body causes goitre which represents a state of partial iodine starvation. Also goitre is extremely prevalent in certain countries, and where this is the case iodine in the drinking water is present in small quantities. Indeed, according to investigations undertaken recently, goitre is present in proportion to the deficiency of iodine in the drinking water. In order to prevent goitre and to treat it effectively deficiency of iodine must be made up in some way and the biological values of iodine must be distinguished from its therapeutic uses. Food containing iodine must be given to supply the bodily lack as far as is possible but in many cases its therapeutic use is indicated both as a means of prevention and cure. The continued use of the iodides to effect this purpose is attended with a considerable amount of danger and a therapeutic agent is to be sought which will provide iodine to the system without incurring this risk. Given that goitre is a conditon of lowered nutrition, it follows that the problem of supplying the deficient and essential iodine element is one of supreme importance and every effort should be made to achieve this object from the biological and therapeutical aspects.

IS THERE GROUND FOR ACTION?

WHEN Abrams' methods and theories were introduced in Boston the quackish manner of exploitation at once raised the suspicion of

unsound and unethical conduct. One person who made extravagant promises of benefits to be derived from the electronic diagnosis and treatment was brought before the Board of Registration and his registration revoked. At a demonstration by Abrams, representatives of this JOURNAL were convinced of the falsity of the findings and uselessness of the therapeutic application of the so-called reactions. Critical and careful examination of the Abrams apparatus by expert technicians did not disclose any apparent electrical reaction of the kind claimed by Abrams.

Now comes the *Scientific American* and, after months of study of the apparatus and the claims of those using it, publishes a denial of the claims made by Abrams and his disciples.

The daily papers with this backing now condemn this monstrous fraud. Like many previous fakes great harm has followed in the wake of this late attempt to exploit the credulous. Not only the deluded patients but many of the disciples who have rented the apparatus really believed in the efficacy of the claims made by Abrams.

The time has come for the authorities to deal with all who are still using the Abrams apparatus.

CURRENT LITERATURE

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CHANGING STANDPOINTS IN CARDIAC MEDICINE

RUSSELL-WELLS, S. (*The Practitioner*, June, 1924), in an article on the changing standpoints in cardiac medicine, states that the amount of energy available to propel the blood along the vascular pathway depends on three independently variable factors: (1) the output per beat of the ventricle; (2) the mean pressure at which it leaves the ventricle; (3) the ventricular rate. He discusses at length the results when any of the above three points are altered. He divides heart failure into two groups: (1) those in which the essential factor is the inability of the ventricles to obtain a sufficient quantity of blood to maintain a normal output. To this group belong cases of mitral stenosis and mitral regurgitation, aortic stenosis, auricular fibrillation, and, in the main, cases of myocardial degeneration. This group of cases we are accustomed to think of as the mitral group. (2) Those in which the essential factor is the ultimate inability of the ventricular muscle to furnish the abnormally large amount of energy required. To this group belong arteriosclerosis, chronic interstitial nephritis, and aortic regurgitation. As aortic regurgitation was the earliest of these conditions to be studied, we may call this the aortic group.

[R. C.]

TINNITUS AURIUM ASSOCIATED WITH ABNORMALITIES OF BLOOD PRESSURE

WHARRY, H. M. (*The Lancet*, May 3, 1924), discussing a series of cases of tinnitus aurium associated with abnormalities of blood pressure, concludes as follows:

1. That cases of severe tinnitus aurium with abnormal blood pressure form a large and important group in which much distress can be relieved.
2. That severe tinnitus aurium may be due to a high blood pressure alone or to a low blood pressure alone, in which case it is usually found to be bilateral.
3. That it may be due to an aural lesion combined with a high blood pressure, or with a low blood pressure, in which case the tinnitus is on the side of the lesion.
4. That in the circumstances just quoted the tinnitus may be cured or improved by removing the aural lesion alone, or by reducing the blood pressure to approximately normal, or by doing both.
5. That trinitrin is of great value as a therapeutic agent in the cases associated with a high blood pressure, as it appears to have a specific effect in relieving the tinnitus.

[R. C.]

POSTOPERATIVE RESULTS OF NEPHROLITHIASIS

BRAASCH, WILLIAM F., and GORDON FOULDS (*Journal of Urology*, June, 1924).

The percentage of actual recurrence in the kidney following conservative operation is less than 10 per cent. Many of the so-called recurrences are really stones not discovered at the first operation. There is a definite period of stone formation, and the high percentage of recurrences may indicate that the patients were not completely past this period at the time of operation. The percentage of subsequent recurrence in the remaining kidney following nephrectomy is so low (2.75 per cent.) as to indicate that an anatomic factor was present in the affected kidney. The percentage of recurrence is greater in cases of single than of multiple stones, and of small than large stones. The percentage of recurrence does not vary greatly with the type of operation for the removal of stone, but rather with the thoroughness. While pelviolithotomy is the method of choice when possible, the dangers of limited nephrolithotomy have been exaggerated, the percentage of patients having nephrolithotomy who had subsequent hemorrhage being small. Nephrolithotomy is particularly indicated in the presence of cortical degeneration adjacent to the stone. There is definite group of cases with a history of repeated formation of stone occurring at frequent intervals over a long period. The average interval between primary operation and recurrence of stone is approximately two years. Fluoroscopy has proved to be of great practical value, and no conservative operation for renal lithiasis is complete without it. The percentage of recurrence following operation if the fluoroscope is used was found to be under 5 per cent.

[B. D. W.]

INTRAVENOUS UROTROPIN THERAPY OF URINARY RETENTION

VOGT, from Mayer's clinic at Tübingen, reports (*Münch. med. Woch.*, June 6, 1924) favorably on the use of intravenous urotropin therapy for urinary retention after obstetric or surgical procedures.

[R. M. G.]

CORRESPONDENCE

A CRITICISM OF A PREVIOUS STATEMENT

August 18, 1924.

Editor, Boston Medical and Surgical Journal:

Dear Sir—You close your interesting article on "Smallpox Versus Vaccination" in the JOURNAL of August 7 with the following statement:

> "The anti-vaccinationists of England have sown the seeds of this disordered logic, and England is reaping the whirlwind of pestilential death."

I was interested to see in the succeeding number of the JOURNAL a brief article quoted from the Bulletin of the United States Children's Bureau, under the heading: "Babies Are Safer in England." In this brief article you say that only 69 out of every 1000 babies born in England and Wales in 1923 died before reaching their first birthday and that this was the lowest infant mortality rate recorded in the history of the country. Surely if a "whirlwind of pestilential death" was being reaped in England, we might expect some indication of it to be shown in the infant death rate.

The best information I have been able to obtain in regard to smallpox deaths in England and Wales for 1923 is that there were six deaths and that there were 2486 cases. Taking into consideration the population of England and Wales, the smallpox deaths for 1923 do not indicate very much of a "whirlwind of pestilential deaths." Have you not just a little exaggerated?

Very truly yours,

HENRY D. NUNN.

The JOURNAL accepts Mr. Nunn's criticism of its editorial fireworks, admitting that figures of speech are dangerous and should not be taken too literally. We cannot, however, accept his complacent attitude towards the smallpox menace. The year 1923 showed marked increase in the cases of smallpox in England, and it is common knowledge that such increase in the case rate is very often followed by an increase in virulence. The whirlwind may not yet have arrived, but the clouds on the horizon are black. Even Mr. Nunn will not deny that a smallpox death is pestilential in character.

AGAIN THE PSYCHIATRIST IN CRIMINAL TRIALS

Dear Mr. Editor:

The recent editorial in the JOURNAL makes an excellent defence of the position of the psychiatrist in criminal trials and does well to point out the numerous existing conditions that control much of his action. The report of the British Committee appointed to make recommendations for the improvement of laws regarding the plea of insanity as a defence suggests that both the British Medical Association and the Medical Psychological Association have thought it worth while to make reports indicating at least an effort on their part towards improvement. Perhaps in England conditions are not as bad as in this country. Certain it is that statistics indicate that murderers in England are usually apprehended, promptly tried and receive a severe penalty, a very striking contrast to conditions in this country. It may be that insanity pleas for defence are much better managed in England than here. That they are badly handled on this side is a general feeling, shared in by psychiatrists, as well as by other medical men and by laymen, as shown by this sentence from a psychiatrist published in a recent issue of the *Boston Transcript:* "If the controversy can be confined to this no-man's land of responsibility the *legitimate field of the psychiatrist will be less besmirched and the laws and customs of the community made less of a mockery.*" (Italics by present writer.)

No one can expect a unanimity of opinion in regard to a question of insanity as a regular product of any method of utilizing experts, but all would, I suspect, be well satisfied with any method that carries the dignity and finality of a decision of the Supreme Court of the United States, which, as the editorial in the JOURNAL points out, "has frequently handed down four to five decisions." I have an idea that much of the public's feeling towards this same Court results from the quality and attitude of those sitting on that bench, a quality and attitude which in psychiatrists in criminal trials would do much to remove one criticism of present conditions, namely, the undignified newspaper notoriety enhanced by interviews and articles in the lay press, some of which appear under the name of the psychiatrist and so with his assumed responsibility, while others, though written by the reporters, probably in large part represent the statements of the psychiatrists, since no denial of them subsequently appears. It is along the lines of creating a public opinion against the methods of at least some medical experts in American courts that good may be accomplished. Perhaps rules of conduct for them might be helpful if formulated by such bodies as the American Psychiatric Association and American Medical Association and the several State Medical Societies, and made encumbent on those retaining their membership in these bodies. Even if this cannot be accomplished, it will help if medical experts in criminal trials realize more than they do now that their present type of participation in these trials is condemned by a large majority of their professional associates. I am one of those who feel that this recent trial in Chicago has brought on the profession of medicine deserved criticism, some of which, at least, could have been avoided by quality and attitude on the part of the psychiatrists, different from the one assumed and more like that of the members of the United States Supreme Court.

HENRY A. CHRISTIAN.

DIPHTHERIA PREVENTION IN THE PUBLIC SCHOOLS

LETTER OF DR. CECONI

City of Boston
Health Department
City Hall Annex

August 15, 1924.

Dr. Jeremiah E. Burke,
Superintendent, Boston Public Schools,
15 Beacon Street, Boston, Mass.

Dear Doctor Burke:

The following progressive report in re diphtheria prevention work in the public schools during the last semester is herewith submitted.

Schick Tests	Readings	Positive	Positive Combined	Positive Pseudo	Negative
39,459	38,218	18,572	866	2,415	16,365

Toxin-antitoxin Injections

1st	2nd	3rd
18,987	18,453	15,890

From the above tabulation it would appear that there were 39,459 Schick tests made; that of these, 38,218 were read, the discrepancy being due to absenteeism.

Of this total, 19,438 were found to be susceptible to diphtheria, and 18,780 were found to be immune.

The total susceptibility of all age groups would therefore be 50.8 per cent.

Immunizing doses of toxin-antitoxin were given to the positive reactors (those susceptible to diphtheria). The number of injections were as follows: 1st injections, 18,987; 2nd injections, 18,453; 3rd injections, 15,890.

Unfortunately the closing of the schools brought this work to a premature conclusion for the time being and makes it imperative that the work be resumed on the reopening of the schools in September. Furthermore the determination of the resultant immunity conferred by the toxin-antitoxin must be sought by re-Schick tests in September, October, November and December.

That a good beginning has been made there can be no question, but that much remains to be done—not only from the standpoint of scientific exactitude but also from the broader and more humanitarian viewpoint of preventive medicine as applied to the health of the school child—will be perfectly obvious to any intelligent and interested person.

So that the writer merely offers this report as progressive, and avails himself of this opportunity to express his deep appreciation of your courtesy and coöperation, as well as of that shown him by your assistant superintendents, principals of schools and teachers.

That the record of 39,459 Schick tests in 40 school days stands on its merits as an accomplishment worth while cannot be gainsaid, but the writer wishes to state that this achievement would not have been possible without the invaluable and wholehearted assistance given by the school physicians and school nurses assigned to this work.

Respectfully yours,

(Signed) JOHN A. CECONI,

Director, Bureau of Communicable Diseases.

By Direction of the Health Commissioner.

Copies sent to the members of the School Committee.

MISCELLANY

CONNECTICUT DEPARTMENT OF HEALTH WEEKLY MORBIDITY REPORT

WEEK ENDING AUGUST 23, 1924

(Including all cases reported before 11 A. M., Monday, August 25, 1924)

Diphtheria

Fairfield County	
Bridgeport	4
Danbury (C)	2
Hartford County	
Hartford	4
Manchester	1
New Britain	1
Middlesex County	
East Hampton	2
New Haven County	
New Haven	2
Waterbury	2
New London County	
Groton (T)	1
Norwich (C)	3
Windham County	
Willimantic	1
State total	23
Last week	28

The following diphtheria bacilli carriers were reported:

Hartford	1
New Haven	3

Typhoid Fever

Fairfield County	
Norwalk	1
Stamford (T)	2
Litchfield County	
New Milford	1*
New Haven County	
New Haven	3
State total	7
Last week	11

*Delayed report.

Scarlet Fever

Fairfield County	
Bridgeport	1
Hartford County	
Hartford	1
New Britain	3
Litchfield County	
Barkhamsted	1
Sharon	1
Thomaston	1
New Haven County	
New Haven	2
Waterbury	1
New London County	
Norwich (C)	3
Windham County	
Woodstock	1
State total	15
Last week	32

Measles

Fairfield County	
Bethel	1
Bridgeport	1
Hartford County	
East Hartford	2
Newington	1
Middlesex County	
Old Saybrook	1
New Haven County	
New Haven	3
State total	9
Last week	5

Whooping Cough

Fairfield County	
Bridgeport	6
Greenwich	2
Stamford (C)	1
Hartford County	
Hartford	1
New Britain	2
Southington	2
West Hartford	1
Litchfield County	
Norfolk	1
Middlesex County	
Westbrook	9
New Haven County	
Madison	4
Meriden (C)	3
New Haven	5
New London County	
Stonington	4
State total	41
Last week	43

Smallpox

Windham County	
Plainfield	1
State total	1
Last week	0

Other Communicable Diseases

Cerebrospinal men.	1
Chickenpox	2
Dysentery (bac.)	1
Encephalitis epid.	2
Malaria	6
Mumps	6
Para-typhoid fever	2
Pneumonia (lobar)	1
Poliomyelitis	9
Tetanus	1
Trichinosis	1
Tuberculosis (pul.)	30
" (other forms)	2
Gonorrhea	19
Syphilis	13

A HALF CENTURY OF CANCER IN CONNECTICUT

A recent tabulation of deaths from cancer in the office of the State Department of Health indicates that during the last half century nearly 33,000 people in Connecticut have died from this disease. The number of deaths attributed to cancer has increased from 204 in 1875 to 1450 in 1923. Computing the deaths by five-year periods and calculating the average number of deaths per year per hundred thousand population for each period gives the following table:

Cancer Death Rates in Connecticut, Averages for Five-Year Periods

Five-Year Period	Average Death Rate	Five-Year Period	Average Death Rate
1875-79	35.2	1900-04	69.4
1880-84	41.5	1905-09	78.9
1885-89	43.0	1910-14	82.0
1890-94	50.2	1915-19	89.2
1895-99	58.0	1920-23*	99.9

*Four years.

These figures indicate a rise of 184 per cent. in cancer death rate from an average of 35.2 for the five years beginning 1875 to 99.9 for the four years beginning 1920. A similar increase is reported from other States and other civilized countries. Some think the increase is only apparent and is due to better diagnosis, changes in age distribution and other factors. It appears likely that the figures reflect in large part a real increase in prevalence of cancer.

THE SCHICK TEST IN WORCESTER, MASS.

THE Board of Health of Worcester, Mass. reports that 1825 children have received the Schick Test and 2488 were immunized in 1923.

The Board looks for fewer cases of diphtheria in the future because about 85 per cent of the susceptible children have been immunized in whole or in part. Vaccination of the school children in school houses has appeared to be an "immense success," because of the educational phase.

THE RESULTS OF THE JULY EXAMINATION CONDUCTED BY THE BOARD OF REGISTRATION IN MEDICINE

PHYSICIANS REGISTERED

Allen, Robert Louis, Vineyard Haven, Mass. Jefferson, 1913.

Apelian, George Solomon, 73 West Brookline Street, Boston, Mass. Beyrouth, 1923.

Balboni, Mary Clara Fennell, 319 Huntington Avenue, Boston, Mass. Middlesex, 1924.

Barkhouse, Charles Keith, 53 Faxon Street, East Boston, Mass. Chicago Ost., 1924.

Barton, Frank Eugene, Jr., Massachusetts Homeopathic Hospital, Boston, Mass. Boston Univ., 1924.

Bliss, Nellie Brown, 16 St. James Avenue, West Somerville, Mass. Mass. Ost., 1924.

Bloomberg, Maxwell, Beth Israel Hospital, Roxbury, Mass. Tufts, 1924.

Blotner, Harry, 15 Davis St., Haverhill, Mass. Tufts, 1924

Bonfiglio, John, 129 West Newton Street, Boston, Mass. Boston P. and S., 1924.

Boudreau, William Joseph, 528 Broadway, Fall River, Mass. Jefferson, 1924.

Boxer, Harry, 1 Poplar Street, Boston, Mass. Tufts, 1924.

Bragg, Fred Alma, 29 Princeton Street, Worcester, Mass. Mass. Ost., 1924.

Brindamour, Jean-Louis Edmond, 1472 Northampton Street, Holyoke, Mass. Jefferson, 1924.

Brown, Harold James, 20 Fairfax Road, Worcester, Mass. Mass. Ost., 1924.

Burns, James Francis, 2 Concord Street, Natick, Mass. Tufts, 1924.

Byrnes, Leo Augustine, 43 Hitchcock Street, Holyoke, Mass. Tufts, 1924.

Caplan, Louis, Boston City Hospital, Boston, Mass. Boston Univ., 1924.

Clarke, Elmer Willis, 46 Wellington Street, Waltham, Mass. Middlesex, 1924.

Cohen, Harold Israel, 111 Washington Street, Lynn, Mass. Tufts, 1924.

Colcord, Marshall, Palmer Memorial Hospital, 560 Blue Hill Avenue, Boston, Mass. Boston Univ., 1924.

Connelly, Ambrose Joseph, Worcester City Hospital, Worcester, Mass. Tufts, 1924.

Cooper, John Paul, 118 Providence Street, Providence, R. I. Middlesex, 1924.

Costanza, Pasquale, 238 Maverick Street, East Boston, Mass. Tufts, 1924.

Crotty, Martin Francis, 82 East Concord Street, Boston, Mass. Boston Univ., 1924.

Curran, Harold Joseph, 13 Church Street, Wheelwright, Mass. Tufts, 1924.

DeDominicis, John, 40 Lewis Street, Everett, Mass. Univ. Naples, 1919.

Desrochers, Bernard Charles, 16 Maple Street, Adams, Mass. Tufts, 1924.

Dietel, Frederick William, 41 Worcester Street, Belmont, Mass. Tufts, 1924.

DiGiorgio, Mary Katherine, 103 Union Park Street, Boston, Mass. Tufts, 1924.

Dorfman, William Wolf, Nassau County Sanitarium, Hicksville, L. I., N. Y. Boston P. and S., 1923.

Dufault, Francis Xavier, Brockton Hospital, Brockton, Mass. Tufts, 1924.

Dumas, James Arthur, St. Elizabeth's Hospital, Brighton, Mass. Tufts, 1924.

Edelstein, Israel, Grace Hospital, 1416 Chapel Street, New Haven, Conn. Tufts, 1924.

Ellis, George Hughes, 80 Van Winkle Street, Dorchester, Mass. Mass. College of Ost., 1924.

Feldman, Samuel Hyman, 301 Spruce St., Chelsea, Mass. Tufts, 1924.

Field, Henry, Jr., Harvard Club, Boston, Mass. Harvard, 1920.

Fletcher, Kenneth Steele, 75 Grape St., Chicopee, Mass. Boston Univ., 1924.

Flynn, George Clifford, St. Vincent Hospital, Worcester, Mass. Tufts, 1924.

Flynn, Thomas Francis, 25½ Barr St., Salem, Mass. Tufts, 1924.

Fournier, Joseph Armand, 11 Choate Street, Fall River, Mass. Univ. Montreal, 1924.

Fox, Samuel, 15 Carlisle Street, Roxbury, Mass. Tufts, 1924.

Gaber, Nathan, 961 Blake Avenue, Brooklyn, N. Y. Middlesex, 1924.

Gallison, Davis Thayer, 70 Strathmore Road, Brookline, Mass. Tufts, 1924.

Gaudreau, Honore Edward, 273 Worcester Street, Indian Orchard, Mass. Tufts, 1924.

Glaser, William, 18 Intervale Street, Roxbury, Mass. Tufts, 1924.

Goldshine, Archie David, 161 Linden Street, Everett, Mass. Tufts, 1924.

Gottlieb, Julius, Massachusetts Homeopathic Hospital, Boston, Mass. Boston Univ., 1924.

Greany, John Vincent, 358 Armory Street, Springfield, Mass. Tufts, 1924.

Green, Dorothy Lincoln, 486 Brookline Avenue Boston, Mass. Tufts, 1924.

Hadro, Valeria Pauline, 69 Maple Street, Easthampton, Mass. Philadelphia Ost., 1924.

Hales, Jesse Collins, 70 Edgell Street, Gardner, Mass. Tufts, 1924.

Hendry, John Joseph, 77 Library Street, Chelsea, Mass. Tufts, 1924.

Henken, Joseph Charles, 44 Lexington Street, Everett, Mass. Tufts, 1924.

Holden, William Hall, 7 James Street, Lynn, Mass Tufts, 1924.

Hubbard, Roger Everett, 11 Leonard Street, Greenfield, Mass. Tufts, 1924.

Huffmire, John Alvin, 84 Thorndike Street, Cambridge, Mass. Middlesex, 1924.

Inman, William Charles, 8 Brown Street, Salem, Mass. Tufts, 1924.

Jacobs, Guy Rigby, 47 Bay View Avenue, Lynn, Mass. Middlesex, 1924.

Kalin, Jacob Isaac, Boston City Hospital, Boston, Mass. Harvard, 1924.

Kaplan, Boris, 921 South Water Street, care of I. Coleman, New Bedford, Mass. Saratov Univ., 1918, Warsaw, Russia.

Keene, Walter Nathaniel, Danville, Me. Am. Ost., 1924, Kirksville, Mo.

Kramer, Hyman Louis, 200 Minot Street, Dorchester, Mass. Harvard, 1924.

Krieger, William Lawrence, 20 Frost Avenue, Dorchester, Mass. Boston Univ., 1924.

Kupper, Morris Jacob, 57 East Fourth Street, New York. Middlesex, 1924.

Lafrenière, Edward Arthur, St. Anne Hospital, Fall River, Mass. Tufts, 1924.

Loring, Robert Edward Lee, Shrewsbury, Mass. Harvard, 1922.

Lynch, Charles Edward, 499 Columbia Road, Dorchester, Mass. Tufts, 1923.

Macchia, Bartholomew Francis, 4 Charter Street, Boston, Mass. Tufts, 1924.

Macdonald, Wilfrid Christopher, Worcester City Hospital, Worcester, Mass. Tufts, 1924.

MacGregor, George Gleason, 82 East Concord Street, Boston, Mass. Boston Univ., 1924.

Mahoney, Stephen Andrew, Jr., House of the Good Samaritan, Boston, Mass. Harvard, 1924.

Maraldi, Carl Francis, 32 Gaston Street, Boston, Mass. McGill Univ., 1924.

McCarthy, William John, 22 Berkley Street, Taunton, Mass. Tufts, 1924.

McGowan, Andrew, 151 Ferry Street, Lawrence, Mass. Tufts, 1924.

Meloni, Charles, 27 Morris Street, East Boston, Mass. Middlesex, 1924.

Miller, Bertha Louise, 19 Hughes Avenue, Springfield, Mass. A. T. Still Coll. Ost., 1924, Kirksville, Mo.

Miller, John George, Jr., Lawrence General Hospital, Lawrence, Mass. Tufts, 1924.

Moore, Floyd, 53 Faxon Street, Orient Heights, Mass. Chicago Ost., 1924.

Moriarty, John Francis, 177 Allyn Street, Holyoke, Mass. Jefferson, 1924.

Movitz, James Hyman, U. S. Marine Hospital, Chelsea, Mass. Tufts, 1924.

Muir, Laura Helen, 111 Metropolitan Avenue, Boston 31, Mass. Tufts, 1924.

Nakashian, Aredis, 550 West 144th Street, New York, N. Y. Am. Univ. of Beyrouth, Syria, 1894.

Nerbonne, Joseph John, 46 Newton Street, New Bedford, Mass. Tufts, 1924.

O'Brien, Thomas Robert, 27½ Magram Street, West Lynn, Mass. Tufts, 1924.

O'Halloran, William Timothy, Boston City Hospital, Boston, Mass. Tufts, 1924.

Ornsteen, Frederick, 77 Village Street, Boston, Mass. Tufts, 1924.

Osterheld, Roger Golden, Westboro State Hospital, Westboro, Mass. Boston Univ., 1924.

Piper, Frank James, 30 Henry Street, Framingham, Mass. Tufts, 1924.

Queen, Hyman Samuel, 65 Russel Street, New Bedford, Mass. Tufts, 1924.

Quincy, Josiah Edmund, 4 Pickman Street, Salem, Mass. Northwestern, 1922.

Ragolsky, Harold, 124 Pleasant Street, Lowell, Mass. Tufts, 1924.

Robbins, George, Carney Hospital, South Boston, Mass. Tufts, 1924.

Robbins, Waldo Whiting, Cambridge City Hospital, Cambridge, Mass. Boston Univ., 1924.

Rubin, Gabriel Jacob, Springfield Hospital, Springfield, Mass. Harvard, 1924.

Rudolph, Israel, 214 Chestnut Street, Chelsea, Mass. Tufts, 1924.

Rudy, Abraham, 5 Esmond Street, Dorchester, Mass. Friedrick Wilhelm Univ., 1923.

Saklad, Meyer, Memorial Hospital, Pawtucket, R. I. Tufts, 1924.

Sala, Ralph della, 124 Bloomingdale Street, Chelsea, Mass. Tufts, 1924.

Scelso, Pasquale, 52 Salem Street, Boston, Mass. Middlesex, 1924.

Seth, John Ambrose, Boston City Hospital, Boston, Mass. Univ. Penn., 1920.

Shahon, Henry Israel, 383 Warren Street, Boston, Mass. Tufts, 1924.

Shulman, Harold Isaac, 14 Fowler Street, Dorchester, Mass. Tufts, 1924.

Silverman, Harry, 61 Kimball Avenue, Revere, Mass. Tufts, 1924.

Simons, Sidney Morton, Box 57, Worcester, Mass. Tufts, 1924.

Spector, Nathan Moses, 32 Shirley Street, Revere, Mass. Tufts, 1924.

Stearns, Hyman, 99 Green Street, Boston, Mass. Middlesex, 1924.

Stern, Louis Nathaniel, 112 Mt. Pleasant St., New Bedford, Mass. Tufts, 1924.

Stusick, Stanley Stevens, 10 Parker Street, Indian Orchard, Mass. Tufts, 1924.

Taylor, Joseph Vincent. Boston City Hospital, Boston, Mass. Harvard, 1921.

Titus, Harold Afton, Lowell Corp. Hospital, Lowell, Mass. Tufts, 1924.

Turner, Rodney Davenport, 555 Commonwealth Avenue, Newton Centre, Mass. Boston Univ., 1923.

Udelson, Barnet Arthur, 57 Greenwood Street, Dorchester, Mass. Tufts, 1924.

Udelson, Herbert Hyman, 120 Greenwood Street, Dorchester, Mass. Tufts, 1924.

Vaughan, Clarence Edwin, 66 Harvard Avenue, West Medford, Mass. Mass. Ost., 1924.

Wandel, Barney, 1680 Beacon Street, Brookline, Mass. Middlesex, 1924.

Whitney, Edward Tracy, 27 Audubon Road, Boston, Mass. Harvard, 1924.

Whitney, Mary Elizabeth, 97 Belmont Street, Everett, Mass. Mass. Ost., 1924.

Whitney, Ralph Holyoke, 1584 Beacon Street, Brookline, Mass. Am. School Ost., 1924, Kirksville, Mo.

York, Robert Stack, 114 Fayette Street, Watertown, Mass. Georgetown Univ., 1924.

Young, Leo Alvah, 844 Adams Street, Boston, Mass. Tufts, 1924.

Youngberg, Paul Philip, 387 Huron Avenue, Cambridge, Mass. Tufts, 1924.

Zellin, Morris, U. S. Veterans' Hospital No. 95, Northampton, Mass. Tufts, 1924.

Zielinski, Ignatius, 67 Hathorne Street, Salem, Mass. Tufts, 1924.

Zonis, Jonathan, 14 Elbert Street, Roxbury, Mass. Tufts, 1924.

Total number examined in July	147
Total number registered	124
Total number rejected	22
False oath taken on application books not rated	1

Rejected applicants were from the medical schools designated below:

St. Louis P. and S., 1923	Middlesex, 1921
St. Louis P. and S., 1923	Middlesex, 1923
St. Louis P. and S., 1923	Mass. Ost., 1924
Athens Univ., 1922	Mass. Ost., 1923
Boston Univ., 1924	Mass. Ost., 1923
Boston P. and S., 1923	Mass. Ost., 1924
Boston P. and S., 1924	Mass. Ost., 1924
Middlesex, 1923	Am. Sch. of Ost., Kirksville, Mo., 1924
Middlesex, 1923	Tufts, 1924
Middlesex, 1924	Mass. Ost., 1924
Middlesex, 1924	
Middlesex, 1923	

THE PROVIN MOUNTAIN CAMP

On Wednesday afternoon, August 27, was dedicated the Provin Mountain Camp in Westfield of the Hampden County Tuberculosis and Public Health Association. This ceremony came at the close of the camp year for the reason that in the effort to make the establishment of immediate use, it was occupied before it was really completed, and in fact the workmen were busy there until the middle of August.

The company assembled numbered two to three hundred, and included many relatives and friends of the children. In the official portion of the party were State Commissioner of Public Health Dr. Eugene R. Kelley, a number of state health officers, representatives of the health and social service departments of most of the cities and towns of the county, with delegates from Hampshire and Franklin counties and from the Boston Tuberculosis Association.

The program was a simple one, with Dr. Parker M. Cort, of Springfield, president of the Hampden County Association, in an address of

welcome and the introduction of other speakers. Mr. John C. Robinson, in an interesting plea for life in the great out-doors, presented the deed for the land which he had given to the camp; Wallace E. Dibble, the architect and a representative of the Exchange Club of Springfield, which had sponsored the construction, turned over the buildings to the Association; and Ernest F. Carlson, the builder, officially tendered the keys to President Cort, with the hope that, since the struggle against disease must be a continuous one, the Association might never have occasion to use them. The dedicatory address was by Commissioner Kelley.

In his short speech of welcome, Dr. Cort made note of the fact that although tuberculosis has been the scourge of the race for centuries, little was done by medicine against it till the movement was instituted to care for little children. Fresh air, good food and proper care are the foundation stones for treatment. The improvement of the children in health in the Provin Mountain Camp have more than justified the cost.

In his dedicatory address Dr. Kelley spoke offhand, commenting on the unusual occasion of assembling to dedicate a building of the kind, and noting that it represented a coöperation on the part of many interests, medical and commercial, that is as yet rare. It is the harbinger of many institutions of the kind. The speaker bore the greetings of Governor Cox, and spent a few moments in praise of the secretary of the Hampden County Association, Mr. Frederic Edwards, whose faithful and unremitting efforts had been so essential in effecting the results. "The plan speaks for itself," said Commissioner Kelley, "but what a preventorium can do and will do, no one can foretell. The reason for this is simple, and is that there are many times in a life where a little makes a great deal of difference. In the development of the physical mechanism of any child, little may mean much, and little may be the determining factor to a successful, normal life." Dr. Kelley spoke further of the value of "prevention when preventing is good," and of the promise that there is in the realization by the people of the advantage of foresight and judgment during the formative period of child life.

Dr. Kelley spoke in terms of high praise of the summer camp of the Malden Health Camp Association, which has effected such excellent work, and passed to the commendation of a Malden man, Representative George Louis Richards, who had secured legislation whereby cities and towns may pool their resources for camps like this, and coöperate with private agencies. "This may result in a Commonwealth dotted with health camps like this one in Westfield," said Dr. Kelley. The speaker went on to a sketch of the State ten-year plan for the examination of school children, and returned to a consideration of the tremendous significance of health camps and preventoria.

The story of the Provin Mountain Preventorium should be of interest to communities that will be in a year or two establishing summer health camps of their own. In 1921 the Hampden County Association established a summer day camp in the out-door school department of one of the Springfield public school buildings, and continued the work in 1922 and 1923 in another one near the centre of the city. With about $2,000 in a special fund the project of a preventorium in the county was agitated early this year. The Exchange Club of Springfield became interested and subscribed a goodly sum of money, which, with the money from the sale of Christmas seals and private donations, made it possible to consider the matter seriously. Mr. Robinson tendered a tract of land on Provin Mountain in Westfield, about two miles east of the centre, and construction was begun. The members of the Exchange Club, being business men, furnished materials at cost, and the architect and builder did the same and on a club week-end the members themselves painted the structures. It was an excellent example of coöperation, whereby a plant with a market value of about $40,000 is in possession of the Association, with but a comparatively small loan remaining unpaid.

The camp faces west on the hillside, with a view of distant ridges of Montgomery, Russell and Granville. Provin Mountain summit rises some three hundred feet behind the camp. The buildings extend parallel with the road and distant from it two or three hundred feet. The dormitories extend north and south from the central unit, which contains administration rooms, the dining room and the kitchen. The wings each include two dormitories, each with a capacity for twenty-six beds, separated by a play room, back of which are the toilets, lavatories, shower baths and lockers. There are thus provided beds and play rooms for fifty-two boys and as many girls, with separate play rooms and utility rooms. Of course the great out-door playground running back to the woods will be always available, save in case of severe storm.

The shower rooms have six sprays each, and many faucets are provided for the washing of hands and drinking purposes. The water supply is from an artesian well, driven through one hundred and twenty-five feet of the brown sandstone, and is constant, abundant in quantity and of excellent quality. It is lifted by automatic pumps into closed tanks at a pressure of about thirty-five pounds, which effects its distribution. Surface drainage and wash water are carried to a cesspool, while the soil from the closets is cared for by a septic tank. A brook near at hand on the property will afford next year the water for a wading and bathing pool.

While the Association intends to open here a preventorium, the establishment has this year

been a summer camp, and at the moment no adequate heating plant has been installed. This of course may readily be done with a portion of the existing structure, or with a special smaller dormitory on the grounds.

The institution is for the benefit of the county, and the children taken are from different places in ratios in accordance with the population or requirements of the different cities and towns.

A NEW CHAIR AT JEFFERSON MEDICAL COLLEGE

In recognition of the far reaching developments of bronchoscopy in the diagnosis and treatment of diseases of the lungs and of esophagoscopy and gastroscopy in the diagnosis and treatment of diseases of the esophagus and stomach, the Board of Trustees and Faculty of The Jefferson Medical College have created a new Chair to be known as the Department of Bronchoscopy and Esophagoscopy. Dr. Chevalier Jackson, formerly Professor of Laryngology in The Jefferson, has been elected to the Professorship of the new Department. Dr. Fielding O. Lewis has been elected to fill the Chair of Laryngology vacated by Dr. Jackson.

A MODERN DEFINITION

MURDER. The act of a person under the influence of phantasy, brain storm or inherited wealth. May be due to heredity. Often leading to death in England. Less often in the United States.

HEALTH NEWS ISSUED BY THE UNITED STATES PUBLIC HEALTH SERVICE

SOME INTERESTING SIDE LIGHTS ON A RECENT EPIDEMIC OF SMALLPOX

THROUGH the courtesy of the State Health Officer of the State of Minnesota, Surgeon General Cumming of the Public Health Service is able to furnish the following information with regard to an outbreak of malignant smallpox beginning in Minnesota in the early part of this year.

The disease was introduced at Duluth in January 1924. The first case was that of a male nurse, 54 years of age, who had never been successfully vaccinated and who died within a few days. Subsequently there developed other cases making a total of 182 for this epidemic. It is interesting to note that 139 of the persons who had smallpox had never been successfully vaccinated in their lives. Of these 139 persons, who had never been successfully vaccinated, 34 died. Of the remaining 43 persons who had the disease, 39 had not been successfully vaccinated within seven years and of these 39, six died. This leaves 4 cases still to be accounted for. Of these, 2 had been vaccinated in less than seven years, but did not die from the disease. Two others had had smallpox when they were children and they recovered. Of those persons who died, although they had been once successfully vaccinated, we have the following histories: One woman age 59 was vaccinated in childhood; one aged 49 was vaccinated when 8 years old. One woman 24 years of age, who was not in very good physical condition at the time she contracted the disease, had been vaccinated in childhood. One man 37 years of age had been vaccinated when he was three and a half years old. One man 55 years of age had been vaccinated when he was six months old. One man who was 55 years of age had been vaccinated when he was one year old.

From these data, which have been very carefully collected, it will be seen that smallpox still runs true to form in that it attacks persons who are either not protected by vaccination at all or who have lost the protection which they once had.

Smallpox has never occurred to any appreciable extent in persons who have been recently, successfully vaccinated.

The fact should be emphasized that one vaccination is not sufficient to protect an individual throughout life. The child should be successfully vaccinated before he enters school; he should be successfully vaccinated again between the ages of twelve and twenty and vaccination should again be repeated between forty and fifty.

Vaccination should be performed at any time when one is exposed to smallpox provided there has not been a successful vaccination within twelve months.

As at present performed, vaccination causes very little inconvenience especially when compared to an attack of smallpox. The first successful vaccination usually causes more inconvenience than subsequent ones.

The production of vaccine is carefully supervised and physicians no longer use the cross scarification method in performing this operation.

One of the best methods of vaccinating is to make a short incision or scratch, a single line, just penetrating the upper layers of skin, stopping just short of drawing blood. Of course, the arm must be cleansed, the instrument sterile, and fresh vaccine should be used. If more than one line is made, care must be exercised to have them far enough apart so that they will not "run together." These lines should not be closer together than two inches.

Another method is the use of a little instrument which makes a very small abrasion on the skin, scarcely more than 1/16 inch in diameter. If two such abrasions are made, these should be at least two inches apart.

There is no country in the world where vaccination and re-vaccination have been sufficiently carried out to eradicate smallpox completely,

but wherever vaccination has been practiced, smallpox has diminished in proportion.

A comparison of the smallpox situation during a five year period in three States which do not differ greatly in number of inhabitants, shows what can be done to prevent this disease.

SMALLPOX CASES REPORTED BY MASSACHUSETTS, MICHIGAN, AND CALIFORNIA, DURING A FIVE-YEAR PERIOD

Year	Massachusetts	Michigan	California
1919	40	2460	2002
1920	29	4845	4486
1921	37	4537	5581
1922	2	1231	2129
1923	6	2311	2025
TOTAL	114	15384	16223

EDITORIAL COMMENT: The Medical Liberty League please take notice.

FUNCTION OF THE VOLUNTARY HEALTH AGENCY

The International Health Board looks upon public health as essentially a function of government. "Yet there is," says Dr. Russell, "a recognized field for voluntary effort in promoting public health. Official organizations, as a rule, must limit their programs to those activities whose worth is thoroughly established in the public mind and for which appropriations are guaranteed; it is difficult to obtain official funds for pioneer work so long as there is any question as to the value of the new project. Voluntary agencies are not bound by rigid statutes or annual appropriations for limited activities and hence have a flexibility which permits them to work productively in unexplored fields and to be of assistance in emergencies.

"Here, therefore, is the province of the voluntary agency; it can and should keep ahead of official health practice in each locality, advancing steadily to newer fields as each of its demonstrations proves successful and the constituted authorities are ready to take full responsibility for the activity. The International Health Board has been conducted on such principles, and it does not feel that any given demonstration has been successful unless its assistance ceases to be needed within a reasonable time. Any project which is not absorbed into the official health service is obviously unsuited to the time or the place.

"There is no end to fresh opportunities. Each new discovery in medicine may have an application in public health. The discovery of insulin makes new work for public health laboratories in the special examinations required by physicians for their patients and in the standardization of the purity and potency of the drug employed. Studies of the function of the thyroid gland have led health departments into the field of goitre prevention. Many such instances might be cited as an indication that voluntary organizations will have for many years to come the same important pioneering function that they have at the present time."—*Information Service of the Rockefeller Foundation.*

NEWS ITEMS

NEW YORK CITY: Dr. Smith Ely Jelliffe, as an official delegate from the American Neurological Association and the American Psychiatric Society, has returned from Europe after attending a meeting of the Alienists and Neurologists of France and the French Speaking Countries, held in Brussels the first week in August.

DR. FREDERICK W. DERBY of Huntington Avenue, Boston, has been appointed opthalmologist to the Boston Department of Health.

NOTICES

BOSTON MEDICAL & SURGICAL JOURNAL.

Boston, Mass.:

The first meeting of the Middlesex East District will be held at the Colonial Inn, North Reading, at 1 p. m., Wednesday, September 17th. Dr. Lloyd T. Brown will be the speaker and his subject will be "Posture."

Yours very truly,

ALLEN R. CUNNINGHAM,
Sec.

UNITED STATES CIVIL SERVICE EXAMINATION

JUNIOR BIOCHEMIST

THE examination will be held throughout the country on October 8. It is to fill a vacancy in the position of technical assistant in sanitary bacteriology in the Public Health Service, Cincinnati, Ohio, and vacancies in positions requiring similar qualifications. The entrance salary is $1860 a year. Advancement in pay may be made without change in assignment up to $2400 a year.

Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the board of U. S. civil service examiners at the postoffice or custom house in any city.

RECENT DEATH

DR. LAURENCE AMBROSE BROCK, a graduate of Boston College in 1895 and of Harvard Medical School in 1900, died at his home in Charlestown, August 15, 1924, aged 48.